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ARCHIVES OF PHYSICAL THERAPY, X RAY RADIUM

VOL. VII

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No. 1

THE RADIOGRAPH AS AN ADJUNCT TO ARTIFICIAL PNEUMOTHORAX*

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BY Artificial Pneumothorax is meant the filling of the potential pleural sac with air or some other gas, through artificial means, the artificial means at this time being a needle inserted into the potential pleural cavity—through the parietal but not through the visceral layer of the pleura. At the present time air is used almost exclusively. As it is forced through the needle, a bubble of it forms between the two layers of the pleura, and makes the potential pleural cavity into an actual one. Since the parietal pleura is fixed to the thoracic wall, the expansion of the actual cavity compresses the lung, just as a sponge is squeezed in the hand.

Artificial pneumothorax is the conservative outgrowth of open surgical procedure—thoracoplasty, in which the lung was collapsed by a very extensive, radical operation, or by rib resection with a temporary continuous opening through the chest wall. The operation of thoracoplasty was followed by a high mortality and

hideous deformity; the rib resection often resulted in death from the sudden collapse of the lung at one time, or by a permanent fistulous opening at the site of operation. Both methods were dangerous and unsatisfactory of result.

The present technique of artificial pneumothorax was developed by Forlanini, of Pavia, in 1894. It was done independently by John B. Murphy, of Chicago, in 1898. The method was not generally taken note of, however, until Brauer, Spengler and others used it in Germany after the dawn of the twentieth century. At present it is one of the recognized methods of treating certain cases of pulmonary tuberculosis and lung abscess.

The pioneers in this procedure used pure nitrogen gas for instillation into the pleural sac. They argued—and rightly—that, since this is the most inert of the gases, it would be absorbed most slowly. Since, however, pure nitrogen is expensive, and since an almost perfect substitute is at hand—the cheapest commodity

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of life—nitrogen gas has been replaced by atmospheric air.

The therapeutic effect of pneumothorax treatment lies in the resultant compression of the lung. The difficulty of curing a tuberculous process in a lung which is carrying on active respiration is the fact that the alternate respiratory contractions and expansions of the pulmonary alveoli—and there are 25,000 each of these contractions and expansions in the twenty-four hours—make healing a very slow, and often an impossible process. Just as lack of immobilization delays or prevents the union of a fracture, so the constant movement of the lung—especially when cavitation is present—prevents healing by distending the tissue bordering the lesion or cavity beyond its natural protective elasticity. Nature, in desperation, throws a heavy eggshell-like wall of scar tissue about the periphery of the cavity and thus further prevents the coaptation of its walls. Secondary infection steps in and makes healing impossible, but it does not prevent the spread of the cavity by natural extension or by breaking through the retaining fibrous wall and coalescing with neighboring cavities or lesions.

With the induction of pneumothorax—artificial or spontaneous—the negative pressure in the thoracic cavity is reduced or made positive. This circumstance allows the natural elasticity of the pulmonary tissue to collapse the lung. If the fibrous walls of a cavity are heavy, they may collapse only after positive pressure of high degree has been induced, or posi-

tive pressure of low degree has existed for some time. The induction of high positive pressure is dangerous and is not used in our technique. As the lung with its cavities is collapsed, the pus is squeezed from it as from a sponge, and the tissue is fixed or "splinted." The cavities gradually granulate over, and their edges approximate.

In employing artificial pneumothorax as the treatment to control serious or continued hemorrhage (with or without demonstrable cavitation), the same principles hold—the collapse compresses the soft-walled vessels and allows clotting and thrombosis in them where severed. So, also, in the case of a lung abscess—the compression of the lung evacuates the abscess into a bronchus and closes the resulting cavity.

It is our practice to employ the greatest discretion in selecting cases suitable for pneumothorax procedure. Only those are considered which have one lung in such a condition as to warrant belief that it will stand the strain of carrying on respiration adequately after the collapse of the other. This criterion holds in all cases, even in serious hemorrhage, for it would be of no use to collapse one lung were the other not able to "carry on." Exclusive of the abscess or hemorrhage cases, the selected patients are placed upon routine treatment for a period of from two to twelve months' time, and the usual factors of rest, diet, fresh air and removal of excess load are allowed their chance. It is only after these means fail or repeated

hemorrhages take place that pneumothorax treatment is resorted to.

The patient is kept under continuous supervision during the entire process of collapse. The first few weeks are spent in bed. The first twenty-four hours after each instillation the patient is not allowed to leave the bed for any reason whatsoever. All activities are rigidly supervised and others are gradually added as the additional toxemia from the collapse is eliminated and the physical condition improves. As far as practicable and consistent with the patient's physical condition and safety, a radiograph of the lungs is taken after each instillation of air.

The end results of pneumothorax administration are varied and sometimes surprising. What is desired, of course, is the collapse of the lung, evacuation and collapse of the cavities, and healing of these cavities with a firm, tenacious scar, which will not give away when the lung is allowed to re-expand and again take on the function of respiration. In a favorable pneumothorax case, the functioning lung as well as the collapsed lung should improve rapidly under the usual routine of rest, etc., and the healing fibrosis should progress more rapidly. Often an arrestment takes place which is complete, as far as symptoms and appearance indicate. Often the sputum, which at the inception of treatment contained many tubercle bacilli, becomes free from them on repeated examination.

A much dreaded sequel—hydrothorax—sometimes occurs after a few instillations.

The patient suddenly develops a high temperature of the septic type, a fast pulse, cyanosis and air hunger. The temperature is due to the sudden overload of toxins resulting from the rapid compression of the lung, while the cyanosis and air hunger result from the marked diminution of the breathing space by the sudden shifting of the mediastinum toward the unaffected side. The air hunger is acute, and the dyspnoea under which the patient labors is terrible to behold—each gasp is apparently the last. As the intrathoracic pressure is re-established these symptoms gradually subside; and if the fluid does not become infected (an infrequent occurrence), an astoundingly rapid improvement in the patient's condition takes place, which may last for months or years, with a gradual absorption of the fluid. Or, a sudden fatal termination may result.

As has been mentioned before, the criterion for the suitability of a case for pneumothorax treatment is the assurance that the functioning lung will stand up under the added burden of double function. One never knows absolutely whether it will or not. Despite the best of care in the selection and management of a case, occasionally the functioning lung will break down while its mate is collapsed. This condition, if realized in time, may be mitigated by allowing the collapsed lung to re-expand, and the ultimate end be postponed.

Where adhesions between the parietal and visceral layers of the pleura have become heavy and dense, they may prevent

collapse of the lung by anchoring the visceral layer to the thoracic wall. If these adhesions are not too firm, they may sometimes be broken by maintaining only sufficient pressure in the pleural cavity to keep them stretched, over a long period of time. At times, however, pneumothorax procedure must be abandoned because of adhesions. Occasionally the fibrous wall about a cavity is so dense that it cannot be collapsed.

In the case of lung abscess, the abscess cavity may burrow peripherally and break into the pleural cavity instead of evacuating into a bronchus, even when only gentle pressure is used or even none at all. Empyema follows. More rarely still, when the abscess burrows into the pleural cavity, a tag of tissue forms a valve over the abscess opening. During inspiration, as the negative pressure in the pleural cavity increases, air is sucked into it. On expiration, as the negative pressure decreases, the tag of tissue closes the opening preventing the egression of this extra air. As respiration goes on the pleural cavity is slowly "pumped up" to a terrific positive pressure, causing not only a pneumothorax on one side, but also causing a compression of the functioning other lung. In one of our cases the positive pressure measured plus 15 cm. of water. The patient suffered so acutely from air hunger that it was necessary to insert a needle into the pleural cavity and leave it in place in order to keep the pressure equalized.

Rarely the pleura have become so thickened as to make it impossible to see the lung through them on the roentgenogram. Exposures ranging in time from one-fourth to four seconds fail to show anything but a solid mass of shadow. In such a case the administrator is extremely handicapped, and must follow the progress of the lung collapse only by means of the manometer readings and the patient's clinical manifestations.

CONCLUSION

It will be easily seen how intimately pneumothorax procedure is bound up with the radiograph of the chest, and how much it depends upon it for success. Without the aid of x ray check-up it would be almost impossible to employ pneumothorax treatment intelligently or successfully. The general condition of the lungs is first determined—which case possesses one lung sound enough to "stand the strain." A chest plate after a few months shows how the affected lung is regenerating. Each instillation is carefully checked up by the x ray wherever possible, and, when the roentgenogram and circumstances show that the treatment is not productive of results, one feels justified in discontinuing it. Especially helpful is the roentgenogram in case the functioning lung is in doubt—when it is breaking down under the strain of double duty, the roentgenogram shows it vividly, and long before physical examination or clinical symptoms much more than suggest it as a possibility.

SERIES A: MULTIPLE CAVITIES IN THE RIGHT LUNG INADEQUATELY TREATED BY TOO INFREQUENT INSTILLATION OF AIR. SEE DESCRIPTIONS OF PLATES.



Plate A1

Plate A2

Plate A3

No. 1. Girl, age 19. Radiograph dated Dec., 1923. Note the drop heart and the multiple cavities in the right lung, from apex to base. Patient was placed on routine treatment for one year after entrance, during which time she grew continually worse and had several severe hemorrhages, extreme toxemia, loss of weight, etc.

No. 2. Dated May, 1924, one year after entrance. Note the increase in the size of the cavities, and that they have thick fibrous walls. The heart is more toxic and larger in size. Average pulse, 120; temperature, 99 to 101 daily. Weight, 96 pounds.

No. 3. Then after third instillation of air. Note the shrinking of the apex with

a decrease in the size of the cavities. Heart is beginning to be pushed to left, and shows added toxemia resulting from the evacuation of the cavities as they are compressed.

No. 4. After twelfth instillation of air, cavities have assumed a circular form and have decreased in size. The heart is pushed far into the left side of the thorax. Patient is gaining weight, with a recession of the severe toxemia. Average pulse, 100; temperature, 98 to 100 daily, with occasional normal temperature for twenty-four hours.

No. 5. Dated April, 1925. After twentieth instillation, pulse averaged 88 and

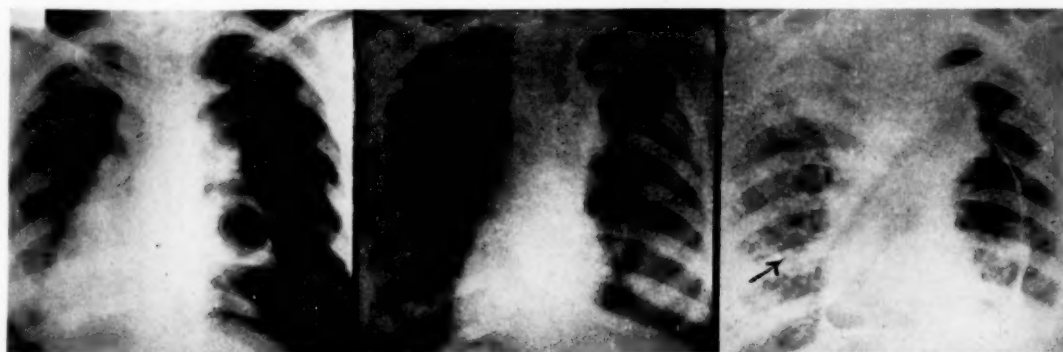


Plate A4

Plate A5

Plate A6

temperature was normal all the time under routine. Weight, 140 pounds. Patient went home and will be given a refill once a month.

No. 6. Dated August, 1925. Refills were given too infrequently, with a resulting re-expansion of the lung and reopening of cavity in upper pole. Patient was

again having toxic symptoms, severe cough, loss of weight, etc. Left lung was suspected of breaking down. Arrow shows formation of cavitation in functioning lung.

NOTE—Patient died in October, 1925, from giving away of functioning lung.

SERIES B: HEAVY FIBROSIS MAKES PNEUMOTHORAX DIFFICULT, BUT CAN OFTEN BE OVERCOME BY PERSISTENCE. CASE FULLY DISCUSSED IN DESCRIPTIONS.

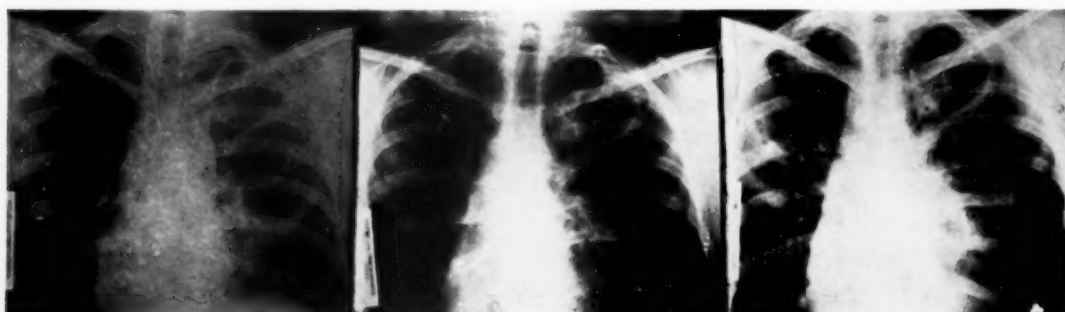


Plate B1

Plate B2

Plate B3

No. 1. Male, age 37. Patient was under routine treatment for seven months before radiograph was taken (Dec., 1923). Marked drop heart and heavy fibrosis was shown extending downward into right apex and downward into right base. A large cavity fills the whole right apex. Fibrosis is to a less marked degree on left side. Sputum showed many tubercle bacilli to

the field. (There was quite a sharp difference of opinion as to whether this cavity was nothing else than an "annular ring," or "annular shadow.")

No. 2. A beginning collapse of right lung is seen. Note that the border of the right lung has receded from the thoracic wall and shows as a faint line parallel to it. The cavity is smaller in size, slightly

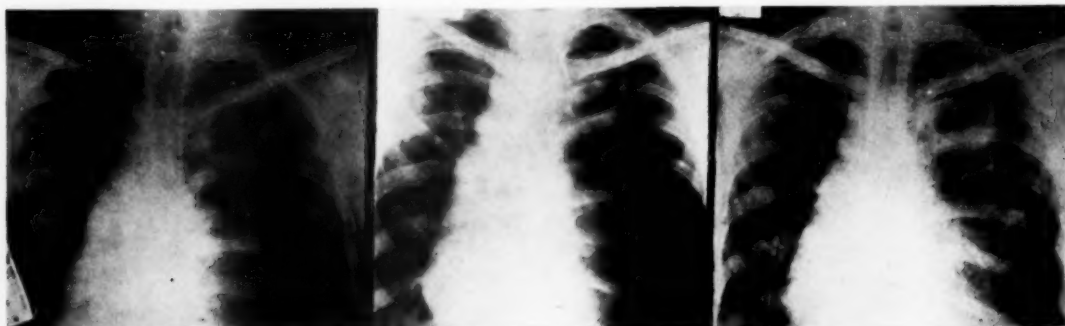


Plate B4

Plate B5

Plate B6

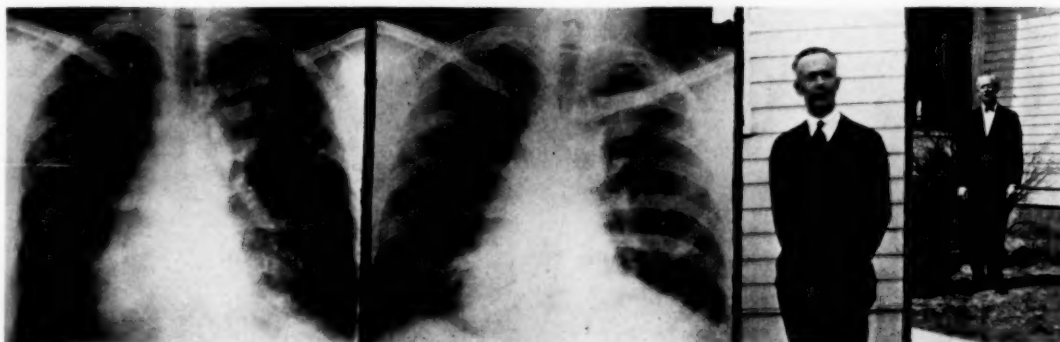


Plate B7

Plate B8

Plate B9

Plate B10

tilted upward and shows the fibrous wall heavier—due to compression of the cavity.

No. 3. The lung border has a deep indentation between the upper and middle lobes, due to the widening of the interlobar fissure. The heavy fibrous wall of the cavity prevents the collapse of the upper lobe, as do the adhesions to the thoracic wall. The cavity is pressed into an elongated shape, and tilted, thus allowing good drainage. The heart is beginning to be pushed over into the left side.

No. 4. The interlobar notch has widened. The base of the lung is practically collapsed. Note the heavy adhesions running from the upper pole of the cavity to the chest wall, preventing collapse. The heart is pushed farther over.

No. 5. Note the extreme gaping of the interlobar notch and the massive adhesions at the upper pole of the cavity. The heart is pushed still farther into the left chest. Further attempts at collapse were abandoned for fear of tearing the lung at the interlobar notch, and because it was decided that the retaining adhesion could not be broken.

No. 6. The lung was allowed to re-expand. Note the closing of the interlobar

notch, the resumption of a circular form by the cavity, and the improvement in the rest of the lung after having been "splinted" for several months.

No. 7. The interlobar notch has closed; the border of the lung has almost reached the thoracic wall. The cavity is much smaller than at the beginning of collapse, and is filled with a dense mass of granulation tissue. The heart has resumed its normal position in the mediastinum.

No. 8. The lung is fully re-expanded. The cavity is practically healed (a later picture shows it further cleared up). The sputum is free from bacilli at this time, and the patient has gained about 40 pounds. The patient felt much better physically and mentally and showed no toxemia. The annoying cough had disappeared, as did the profuse expectoration of foul sputum.

No. 9. The patient in September, 1923, is very thin, pale, nervous, neurotic and unable to "fight back."

No. 10. The patient in March, 1925, is robust, optimistic and salvaged for further participation in the battle of living.

SERIES C: HYDROTHORAX FOLLOWING BEGINNING OF PNEUMOTHORAX TREATMENT FOR PULMONARY HEMORRHAGE IN EPILEPTIC.

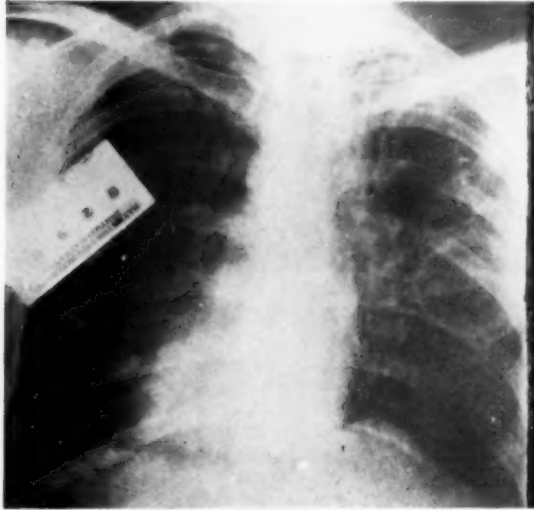


Plate C1

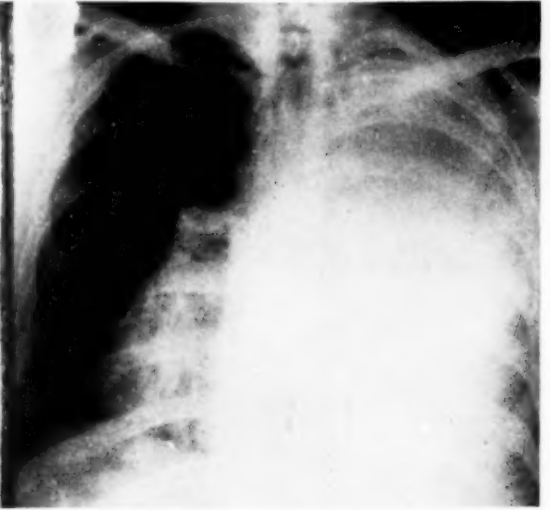


Plate C2

No. 1. Male, age 30, epileptic, weight 113 pounds. Previous to entrance to the institution he had been diagnosed syphilitic (because of the epileptic seizures), and had been treated with massive doses of KI, which caused the excavation of a large cavity at the periphery of the middle lobe of the right lung, with a heavy fibrous

wall. There is another excavation just above this cavity which is hour-glass in shape. Patient began to hemorrhage daily.

No. 2. Pneumothorax treatment was instituted. The hemorrhage ceased after the first instillation. After the third instillation there developed a high temperature (103) of the septic type, with a rapid

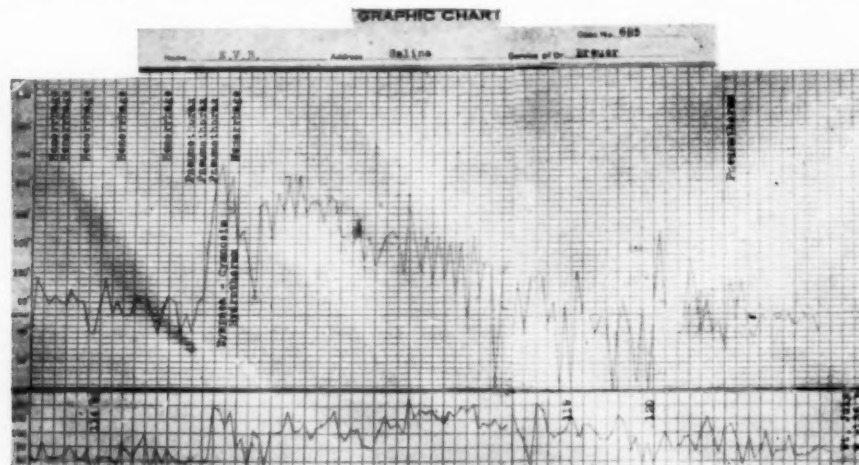


Plate C3

pulse (140), extreme cyanosis and marked air hunger. On expectant treatment the symptoms receded, the temperature gradually dropped and the patient gained 27 pounds in five weeks. The radiograph showed a persistent hydrothorax, which was left undisturbed. Patient died eleven months later from edema of the lungs fol-

lowing a severe epileptic seizure.

No. 3. The chart shows the progress of the above case for a period of several weeks. Note the marked increase in the symptoms following the development of the hydrothorax and the gradual drop by lysis as the toxemia was thrown off and the physical condition improved.

SERIES D: A CASE OF LUNG ABSCESS IN WHICH PENUMOTHORAX WAS ATTEMPTED.

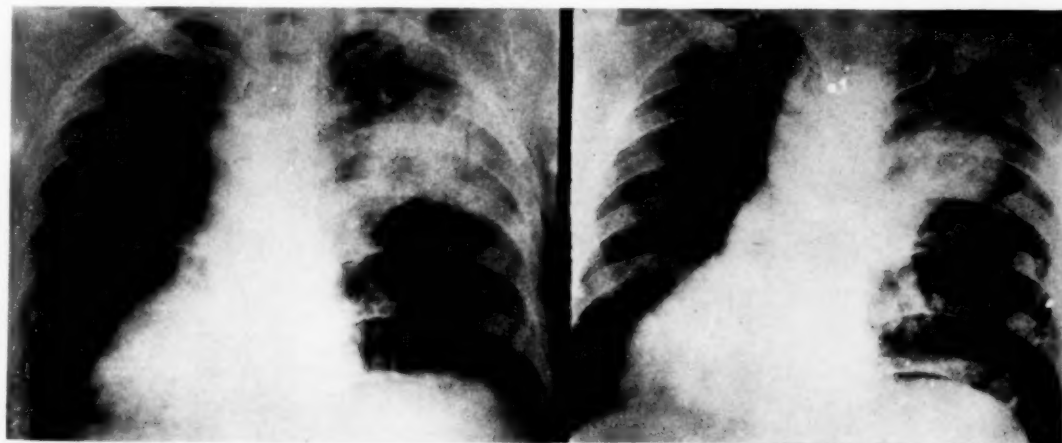


Plate D1

Plate D2

No. 1. A lung abscess appears in right apex—a typical case for pneumothorax. The left lung is in a very good condition.

No. 2. There is partial collapse, the

abscess is compressed and is emptying into the bronchus with profuse expectoration. It suddenly burrowed through visceral pleura into pleural cavity with resultant death of patient.

SERIES E: TUBERCULOUS PULMONARY HEMORRHAGE SUCCESSFULLY TREATED.

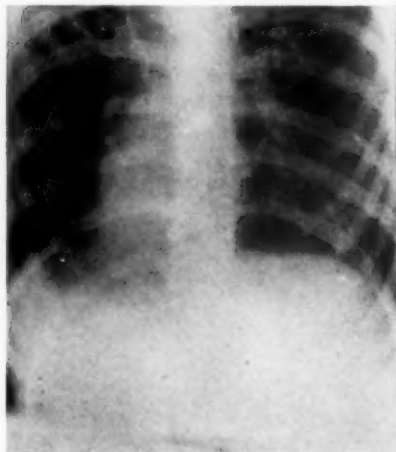


Plate E1

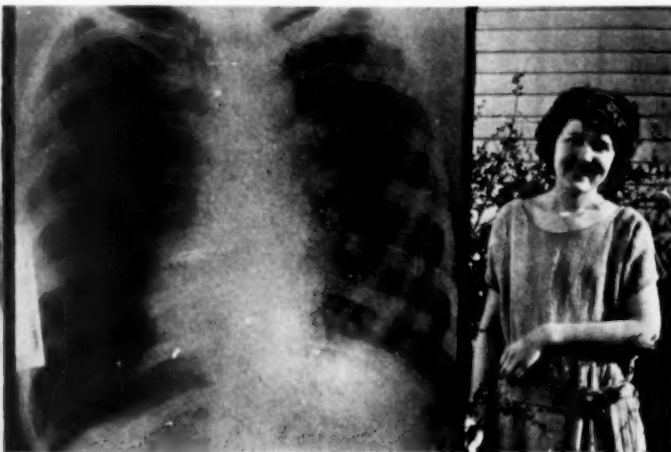


Plate E2

Plate E3

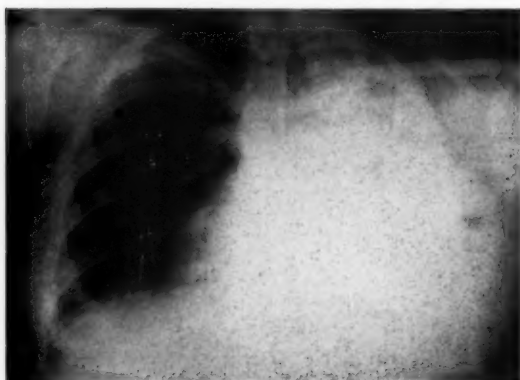
No. 1. Girl, 18 years of age, suffered severe, repeated hemorrhages. The left apex was riddled with cavities. The right lung is in only fair condition. (The heavy, white circle in the right apex is a button on the patient's underwear.)

No. 2. Thirty months after collapse, a heavy adhesion is still present in the left apex. More fibrosis appears in the right

lung. Patient gained 46 pounds and was the night nurse at the institution for seven months. At present she is taking a course of tuberculosis nursing in New England. Lung has been collapsed over three years.

No. 3. Patient thirty months after collapse, to all appearances is in perfect health.

SERIES F: PENUMOTHORAX IN ITS DEVELOPMENT.



No. 1. This is a pneumothorax case in which the right lung is in the process of collapse and has had repeated instillations of air. The heavy pleura obscures all lung detail except at the extreme right apex.

BRONCHIAL GLAND TUBERCULOSIS*

A STUDY BASED ON CHILDREN AT THE PRENDERGAST PREVENTORIUM, BOSTON TUBERCULOSIS ASSOCIATION

JOHN B. HAWES, 2ND., M. D., PRESIDENT, BOSTON TUBERCULOSIS ASSOCIATION,
AND ELI FRIEDMAN, M. D., PHYSICIAN TO THE PRENDERGAST PREVENTORIUM.

THE objects of this study which we have carried on during the past six months or more have been not only to ascertain as far as possible the condition and progress of every child entering the Prendergast Preventorium, but more especially to demonstrate what we believe to be a chaotic state of affairs among clinicians and roentgenologists as far as the diagnosis of bronchial gland tuberculosis is concerned, and also to point out what we believe to be the vital factors in the diagnosis of this condition.

Our report is of necessity a preliminary one. Six months is too short a time and 100 children too small a number on which to base conclusions. This we frankly admit. While the tone of our report is a critical one, the fact that it is one of constructive and not merely destructive criticism justifies its existence.

As stated above, this investigation is based on examinations of children admitted to the Prendergast Preventorium, a small institution in Mattapan, owned and managed by the Boston Tuberculosis Association. The word, "preventorium," itself indicates that these children are not sick and are not suffering from clinical or

active tuberculosis as are those for instance at the Westfield State Sanatorium. This point must be borne in mind. Each child, however, comes from some family in Boston in which there is or has been some adult or other case of consumption, and has therefore been intimately and actively exposed to tuberculosis. In addition to this, further requirements for admission demand that there be a positive Von Pirquet test, x ray evidence supposed to show bronchial gland or hilus tuberculosis, and finally that the child in other ways has been made "free to gain" by the removal of bad teeth, tonsils or other possible sources of infection.

There are twenty permanent beds at this institution and the average length of stay of each child is four to six months. During July and August of last summer, and we expect to do the same in future years until we can increase the number of permanent beds, we made temporary arrangements for about 80 boys and girls of the same age as the others, seven to fourteen years, and admitted them under the same conditions. Therefore, we have had opportunity to examine carefully about 100 children—contact cases—all meeting the same admission requirements.

*Republished by permission of authors and publishers, Boston M. & S. J., 192:954-956, May 14, 1925.

Every Tuesday morning we have conducted a clinic at the camp and made the examinations on which this report is based. Each of us looked over the children separately and wrote down our findings and our independent opinion as to the x ray picture *before* reading the report of the examining physician and the x ray report of the referring agency, which in nearly every case was the Boston Sanatorium.

The special points we have studied and are reporting on here are:

- a. X ray evidence.
- b. d'Espine's sign.
- c. Parasternal and vertebral dullness.
- d. Eustace-Smith sign.

X RAY EVIDENCE

It became apparent to both of us almost at the start that in many instances we were unable to agree with the x ray interpretations as given on the records of the agency referring the children to us. While in practically every case the x ray report accompanying the child spoke of definite pathology of the hilus tissues, presumably thought to be due to tuberculosis, to us such appearances were well within normal limits. For instance, out of 29 x ray films which according to the report of the Boston Sanatorium showed "tuberculous bronchial glands," "hilus tuberculosis," or "frank tuberculosis," we found in looking over the records that in our own opinion 17 were normal, 6 slightly suspicious, 5 suspicious and only 1 showed frank tuberculosis. To confirm our belief that there was a vast diversity of opinion as to this

we took 50 consecutive x ray films, each of which was said to show pathological changes, and obtained independent opinions from three prominent roentgenologists of this city, with the result shown in the following table:

TABLE I

INTERPRETATIONS OF 50 CONSECUTIVE X RAY FILMS OF CHEST, EACH SAID TO BE "SUSPICIOUS" OR "FRANK TUBERCULOSIS" BY AGENCY REFERRING CHILD TO PREVENTORIUM.

	Normal	Slightly suspicious	Suspicious	Frank tuberculosis
Dr. X	29	11	8	2
Dr. Y	26	16	8	0
Dr. Z	30	8	10	2

In only 14 out of the 50 cases did these three x ray men agree. These they all considered normal. In five cases one roentgenologist said a persistent thymus caused the x ray shadow. Here is a very remarkable state of affairs. One competent roentgenologist says 50 films show pathological changes, presumably tuberculous, and three of his confreres equally competent are of the opinion that more than half of these are within normal limits and only two represent frank or open tuberculosis!

D'ESPINE'S SIGN

Ever since d'Espine described his sign of enlarged tracheo-bronchial glands, there has been a great deal of controversy about it. This sign, in brief, consists in auscultation of the voice, especially of the whispered voice, along the course of the trachea posteriorly. Normally, the characteristic tracheal tone and the clearness of the whispered words stops at about the level of the seventh cervical vertebra. In cases of enlarged tracheal glands, the tra-

cheal tone is transmitted by these glands, at times as low as the fifth dorsal vertebra.

In using this sign, we have taken into consideration the fact that the bifurcation of the trachea sinks from the seventh cervical in infancy to about the third dorsal in later childhood, and so we have made this an arbitrary standard for our own use. We have called this sign *negative* if intense bronchial whispered voice was heard only as far as the first or second dorsal vertebra, *slightly positive* if heard to the third dorsal vertebra, and *positive* if heard as far as the fourth dorsal or lower.

A close examination of this sign revealed several points of interest. There seemed to be considerable disagreement between the different examiners as to the exact level that the d'Espine was heard in several cases. Thus an examination of this sign in 53 children, done by the Boston Sanatorium and ourselves, showed the following:

TABLE II
D'ESPINE'S SIGN

	Positive	Slightly positive	Negative
Boston San.	10	2	41
Dr. Hawes	3	10	50
Dr. Friedman	8	18	42

In one case the Boston Sanatorium found a d'Espine's sign down to the fifth dorsal vertebra; one of us found it to the sixth, and the other to the second. In another instance, one of us found it to the fifth and the other one only to the second dorsal vertebra. In two cases in which the Boston Sanatorium reported it at the level of the fourth and fifth vertebra respectively we found it only to the second. In one

case in which very marked enlargement of the bronchial glands was reported on x ray examination the d'Espine's sign was declared to be negative.

A further study of the d'Espine's sign as related to the roentgenological findings showed considerable discrepancies. In some cases the x ray examination as interpreted by a competent roentgenologist showed definite hilus pathology, while the d'Espine's sign was negative, and in others just the reverse was noticed, as is shown by the following table:

TABLE III

X RAY SIGNS AS COMPARED WITH THE D'ESPINE'S SIGN
IN 85 CASES

No. of Cases	X Ray	d'Espine's and other signs	Percentage
20	Positive	Positive	24%
30	Negative	Negative	33%
15	Positive	Negative	20%
12	Negative	Positive	14%
8	Doubtful	Doubtful	9%

Since we have had no postmortem examinations on any of the 27 cases where the x ray findings disagreed with the signs, it is impossible to state which is the more reliable. However, this much is certainly evident: First, that there is a marked variation in results in eliciting this sign which greatly detracts from its usefulness; second, that when distinctly present it is far from being pathognomonic of tracheal gland enlargement as some would have us believe.

PARASTERNAL AND VERTEBRAL DULLNESS

Both of us, though very skeptical as to the value of either parasternal or paravertebral dullness, endeavored to keep our minds absolutely unbiased as to these points and in each child we examined, per-

cussed out the areas on either side of the sternum and between the scapulae with the utmost care and recorded our findings. If we followed the x ray report of one radiologist there should have been at least some slight dullness either in front or posteriorly if the signs were of any value; if we believed the reports of the three other roentgenologists, a large number of negative cases was quite to be expected. The following tables show the comparative figures:

TABLE IV

	PARASTERNAL DULLNESS		
	Positive	Slightly positive	Negative
Boston San.	2	6	50
Dr. Hawes	0	1	62
Dr. Friedman	0	0	63

TABLE V

	PARAVERTEBRAL DULLNESS		
	Positive	Slightly positive	Negative
Boston San.	2	6	50
Dr. Hawes	0	1	62
Dr. Friedman	0	0	63

These figures give striking evidence that in this group of children at least, who were *supposed* to have hilum tuberculosis as shown by the x ray, neither parasternal nor paravertebral dullness is an important factor in diagnosis. One must remember, however, that as we stated at the beginning of this paper, these are not *sick children*; they are potential consumptives, contact and infected cases and not to be compared with a group such as is under the charge of Dr. Henry D. Chadwick at the Westfield State Sanatorium. His children are sick children and naturally would show more in the way of signs both by x ray and clinical examination than do those on whom we are here reporting. This perhaps ex-

plains to a slight degree why Dr. Chadwick finds interscapular dullness a sign of value and we do not. Dr. Chadwick makes the interesting point that it is a sense of resistance and a feeling of tenseness or spasm of the skin and underlying tissues rather than a dull sound to percussion on which he depends. He agrees with us that parasternal dullness is a sign of little or no value, however.

EUSTACE-SMITH SIGN

This sign, which has received wide attention, consists of a clear, continuous hum or bruit heard over the upper part of the sternum when the child's head is retracted as far as possible. We have called the sign positive when such a bruit was heard, slight negative if a bruit but not a continuous one was present and negative if nothing was heard.

The Boston Sanatorium did not report on this sign except in four cases. Out of 60 children one of us found it positive in only 4, suggestive in 7 and negative in 49 cases, while the other also found it positive in 4, suggestive in 2 and negative in 54 cases. We both agreed on the positive and suggestive cases. This sign is said to be found also in short-necked children without glandular enlargement. That its value in diagnosis of enlarged hilus glands is therefore very small indeed is evident.

SUMMARY AND CONCLUSIONS

I. There is at the present time an amazing difference of opinion among x ray men and between roentgenologists and

clinicians as to the interpretation of x ray shadows of the hilus region in children. There is no apparent unanimity of opinion as to what constitutes normal or abnormal, tuberculous or nontuberculous, active or inactive, old or recent. This is a most unsatisfactory state of affairs and one that should not be allowed to continue. We would call this situation to the serious consideration of the roentgenologists of this country.

II. We believe that there is urgent need of further study as to the effect of acute nontuberculous respiratory tract infections upon the hilus glands and tissues from both the clinical and roentgenological aspects.

III. We are of the opinion that both the d'Espine's sign and the Eustace-Smith sign

are of comparatively little value; further, we believe that so-called parasternal dullness is a point of no value and that paravertebral or interscapular dullness are of value chiefly in the hands of those very few whose skill in percussion is highly developed. We agree that in the case of children who are actually sick with tuberculosis and are not merely infected contact cases, paravertebral dullness may be of real value in diagnosis.

IV. The whole subject of the diagnosis of bronchial gland or hilus tuberculosis is still in a stage of doubt and uncertainty. "Signs" at the best are unreliable and x ray evidence at present of little value. Diagnosis should be based on history, exposure, positive Von Pirquet and constitutional signs and symptoms.

PHYSIOTHERAPY: A NECESSITY IN THE TREATMENT OF INDUSTRIAL WOUNDS*

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PHYSIOTHERAPY is necessary in the treatment of industrial wounds. Surgery can perform limited service only, and then what is to be done to rehabilitate those unfortunate victims of industry who have given their labor and limbs for the purpose of either turning raw material into finished products or transporting them to their final destination? The Medical Man's obligation does not stop at the healing of a wound, the uniting of a fracture, or the restoration of a nerve, but it is his plain duty to conduct his patient to the end that a common livelihood can be maintained. The dismissal of a patient with the cruel words, "Go, and perhaps Time will be kind to you, and some day your function may be restored to the extent that you can do some light form of work," places a great handicap upon the individual. Put yourself in his place. The morbid fear created in his mind will sink his already weak and mutilated frame into the depths of despair. Is there no ray of hope? Yes—Physiotherapy. The silver lining appears upon the cloud, and his spirit is quickened with impulses which tend to overcome his misfortune, and he begins anew to fight for his existence and for those dependent upon him. Yet without Physiotherapy this would be impossible, and no longer are manipulation, mas-

sage and electrical currents fads or fancies; they have become living realities, even necessities, with definite indications.

Fortunately, the majority of industrial wounds are minor in character. Chief among them are cuts, bruises, contusions, strains and sprains. The cuts and open wounds are treated as poor surgical cases, but some do not readily heal, and to these physiotherapy is added for their successful termination. The smaller wounds are aided by radiant light and convective heat, while the more extensive ones require ultra violet therapy and diathermy because of its marked analgesic properties, and its capacity for absorbing exudates. In joint injuries, not complicated with dislocation or fracture, if seen early after trauma, diathermy alone will cure; if of long standing, manipulation, massage and the sinusoidal current must of necessity be added.

Infections give rise to much damage to tissue and function. A tiny puncture wound may be the avenue which leads to a motionless joint, a distorted tendon, or perhaps the loss of a limb. Every infection is a potential hazard to life or limb; therefore, infection must be coped with by the most influential modalities in the hands of the surgeon. Free drainage is of first importance, but even in wide open wounds, draining adequately, the infection often

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spreads. Antiseptics are of little avail; tonics are too slow in action; something drastic must be done immediately. Invite electrotherapy. Employ the radiant heat lamp or the ultra violet lamp. If neither is available expose the wound to the sun's rays an hour or two each day and improvement will begin at once. If an infection be in a limb, apply a cuff electrode above and below the wound and allow the high frequency current to pass between. Diathermy furnishes the necessary aid. The germs are attenuated by the heat, the resistance of the tissues is raised, more leukocytes are concentrated about the wound, the opsonic index is raised and a more positive chemotaxis is created; all of these tend to check infection and promote healing. In cases of long continued low grade infection, sharpen the patient's resistance with the ultra violet ray or autocondensation, for increased metabolism is essential in overcoming infection.

Other cases which cause concern are back injuries without distortion or fracture of vertebrae. I am convinced that back pain is real for the reason that I am called upon to treat a vast number where a legal cause of action does not exist. A golfer who makes a misstep in a bunker, a tennis player who assumes an awkward position in return a tricky serve, the accommodating husband who carries the wife's trunk upstairs after her return from a summer vacation, besides the many others which are received in line of duty by lifting heavy loads pursuant to their

occupation, are all active sufferers. Radiant convective heat seems to relieve painful backs better than any modality, if the case is a recent one. This heat causes a relaxation of the back muscles and allows them to return to normal. In cases of long standing, negative galvanism applied to the painful area, followed by the faradic or rapid sinusoidal currents, will almost always give permanent relief. Again, autocondensation can be used for a few minutes, then apply the direct Tesla current through a nonvacuum electrode over the painful spots; this method has given relief when the others have failed. In undertaking back cases, impress the patient that sufficient time and regularity of treatments are quite necessary or he will become discouraged and quit at the time when the most benefits are likely to be obtained.

Considerable assistance can be given fractures and joint injuries. Physiotherapy will not reduce a fracture nor hold it in position, but with this done and maintained for the customary time, it is most accommodating in restoring function. Radiant convective heat, applied to a Colles fracture, will make reduction much easier and less painful, but as anesthesia is generally indicated in most fracture reductions, there is no advantage in employing other than ordinary recognized methods. The appearance of a limb after its removal from a splint, with its atrophied muscles, rough and undernourished skin and often an unsightly pronounced callus, suggests to the patient that the use of the

member is forever lost. Explain the reason for this, and assure him that the high frequency and sinusoidal currents and massage will soon revitalize its looks and function. In fractures which are slow in healing diathermy, along with massage, encourages firmer union because of its stimulating effect upon callus formation. The prognosis in ankylosis following fractures or infections is always doubtful, and it is my opinion that true bony ankylosis will not yield to any treatment. Should the x ray show the bones forming the joint mottled, "raw eaten" or fused, an unfavorable opinion is given, but if they are smooth and clear in outline, a more favorable one is assured. Pseudoankylosis is amenable to treatment by diathermy and the sinusoidal current, together with manipulation and massage. Time, persistence and tactful management are very necessary to reestablish motion and function.

Painful stumps following amputation require physiotherapy. Even after classical amputation, where the nerve ends are dealt with most carefully and the most finished technique carried out in protecting them, pain often develops. I have had occasion to treat a number of these, and was able to relieve pain that had existed for many years in one case. Many remedies had been tried in this case—massage, diathermy direct and indirect, negative galvanism, modified Scotch douche and various kinds of light and heat therapy—but none proved successful. A mild Tesla current through a vacuum electrode was

applied to the painful scar and this afforded the long sought relief. I have noted that a mild current will soothe, while a stronger will aggravate. This also applies to keloid destruction in postoperative scars or sensitive scar tissue in any other place.

Again physiotherapy is necessary in cases where there has been a large amount of tissue destroyed. Burns, for example, and wounds where the skin has been literally torn from its place. When the remaining devitalized tissue has sloughed away and healthy granulations replace it, the ultra violet or nature's own sunlight, followed by radiant light, aptly provide adequate means for a more rapid recovery. It may also be said that wounds treated in this manner heal with smooth, flexible scars, without contracture and with function well maintained.

Injuries to the chest demand physiotherapy. Contusions of the chest wall without rib fracture are extremely annoying, for with every respiratory movement some pain is felt. Radiant light and diathermy afford most relief, and it is extremely gratifying to see excellent results follow their use. Added comfort will be given if adhesive plaster is snugly applied to the chest after treatment.

Another class of injuries which is benefited by physiotherapy is that of the head and brain coverings. I am positive that injuries to the brain coverings, with or without visible outward signs, do occur. Recently I have performed autopsies in

two such cases to ascertain the direct cause of death. One showed only a slight skin abrasion, the other did not, and no fracture was present in either case. Upon removing the vault, both cases presented a bruised bloodshot area about two inches in diameter, with a heavy exudate between the dura and skull. The dura was carefully dissected from the brain substance and a perfectly normal brain lay underneath the bruised areas. This experience convinced me that the brain coverings are more vulnerable than brain tissue itself, and that the exudate thrown out is largely responsible for the excruciating headache which follows head injuries. I say exudate advisedly, for no hemorrhage was observed and the dura was not punctured, neither did it resemble blood serum or spinal fluid in either consistency or color. As diathermy has specific action on exudates, this may explain why headaches in such cases disappear after its use. Diathermy can be given directly or indirectly over the site of injury, or by applying a thin block tin electrode to the forehead and another on the nape of the neck. It is well to try both methods to ascertain which gives the more relief. Localized pain and headache in patients where a trephine has been done and bone removed, is probably due to adhesions formed between the dura and skin of the scalp. Indirect diathermy is the modality of choice for the reason that the current is easier applied in this manner, for electrodes are difficult to conform to the various scalp irregularities left by these wounds. Ionization of calcium chloride through the eyes by positive galvanism is

valuable in relieving paralyses of brain trauma, but diathermy affords much quicker relief from pain.

Besides the actual wounds of industry, the psychic neuroses which follow are admirably treated by physiotherapy. A complex tacked on to an injury often proves more annoying than the wound itself. If the patient believes that he is afflicted with some vague injury to his brain, his spine or other vital organ, it is hard to persuade him otherwise. This preys upon his mind until he develops a morbid psychosis. He thinks of his neglected family, his inability to work again, and even threatens suicide, or the life of his employer because his mental attitude is far below normal. My way of disposing of such cases is to have the patient tell his ailments over, and over and over again, until he is positive that I agree with him and understand him. I make him feel that he has thoroughly convinced me that such symptoms exist, and that his case is peculiar and out of the ordinary. I gain his confidence by sympathizing with him, and when he is keyed up to this point I apply psychology and physiotherapy. I place him on the autocondensation pad and turn on the current, then touch him on various parts of the body so that a jump spark will demonstrate the presence of electricity passing through him; explain that this powerful agent is penetrating every tissue in his body, in like manner. Assure him that before this wonderful modality was introduced into medicine that nothing could have been done, but now, even so serious a case as his can be abso-

lutely cured. He then finds himself, and the outcome is never in doubt, for he begins to talk to his family, his neighbor and his employer about the marvelous recovery he is going to make; and in a short while he is back on the job doing even harder work than before. This feature alone is sufficient reason for the use of physiotherapy in industrial surgery.

Finally, physiotherapy is a necessity in the treatment of industrial wounds, because the results obtained are actual, positive and permanent. A quicker return to work is guaranteed both patient and employer. The economic loss to society is markedly decreased, the total permanent disability is reduced to a minimum and cases which have heretofore been pronounced incurable by experts respond to physiotherapeutic modalities. Beside all these undeniable facts, a better understanding and a more kindly feeling of goodwill are cemented between employee and employer, and more just and equitable settlements are perfected. Therefore, physiotherapy has been elevated to the high plane it rightfully deserves, and has become an integral necessity in the treatment of industrial wounds.

DISCUSSION

Dr. E. C. Duval: After listening to such an exhaustive paper and one that is so complete, I feel I know very little about industrial physiotherapy. It has been my good fortune to have had the cooperation of Dr. Walke, with some very valuable suggestions from him in the treatment of certain cases in which we have obtained success.

For that reason I can perhaps appreciate the value of his paper more than you who have not been in association with him as I have.

I noted that he stressed the psychic neurosis that we are in the habit of encountering sometimes in industrial cases. That is a fact that strikes you with great force if you do any amount of industrial work. Many times I have seen industrial cases come to my office for treatment after the surgeon who had had the case had done the most wonderful work that was possible for a surgeon to do, but there were sequelae remaining to be treated by the physiotherapist, and, of course, the surgeon referred him to the insurance company to have him in turn referred to the physiotherapist. After the first treatment, invariably the patient would say, "That is more than the other doctor did for me in all the time that he had me," not realizing the importance of the surgeon's work. The fact that he was given a little relief by the physiotherapeutic treatment brought to his mind, ignorant as he might be, the idea that that one physiotherapeutic treatment had done him more good than all the surgeon's work.

The fact is that you should not allow your patient to leave your office and go into the hands of someone else if you are at all equipped to give him physiotherapeutic treatment if it is indicated. That is a condition that we meet every day in industrial physiotherapy. The economic value of physiotherapy as outlined in Dr. Walke's paper is a thing beyond question.

It has been my experience to note, in the past two or three years, a number of cases that were allowed to go without any treatment after the surgical work had been done, and the patient, as Dr. Walke said in his paper, was told to do the best he could for himself. The working man, when he is left to his own resources in such a condition, doesn't know where to begin to do for himself, with the result that if he has had a fracture, for instance, in close proximity to a joint, that joint, after the cast is removed, is quite stiff. He doesn't know how to begin to make that joint function again. Many times he is allowed to go along from week to week, the insurance company paying him compensation, whereas a very short period of physiotherapeutic treatment would perhaps long since have terminated his disability.

I have under treatment now one case where the patient had osteomyelitis of the foot. The doctor who originally treated him was not a surgeon, nor an industrial surgeon, for that matter. He attempted to reduce a comminuted fracture of the astragalus by the open method. Infection set in and resulted in osteomyelitis. That man was discharged from the hospital with a foot 21 inches in circumference around the malleoli, a great, big, soft, edematous mass. He was sent home from the hospital and was home for five months with a sinus on the internal side of his foot about three inches long and a bony exudate coming out of that sinus.

That man was put under physiotherapy treatment, and in three months and a half

he went back to work on that foot and the insurance company paid him, I think, approximately 25 per cent loss of the use of the foot. It was my firm conviction that had physiotherapeutic measures been instituted when that man left the hospital or when he left the care of his surgeon, who had attempted to reduce the fracture by the open method, his disability would have ceased in about two months from that time. As it was, he was disabled from that time for approximately eight months and a half. That is an example of the economic value of physiotherapy.

Dr. A. C. Tenney, Chicago, Ill.: In the two cases of autopsy recited, did the death occur immediately following the injury or some time after, and do you attribute the death to the condition found in the brain?

Chairman Coulter: Dr. Kobak, didn't you or somebody in your office do some work in relation to diathermy and its penetration in the brain?

Dr. Disraeli Kobak: With Dr. Hollender's permission, I would say that the work is being carried out right now to determine and prove that diathermy penetrates the brain substance to the degree of the size of the active electrode and no injurious effects follow diathermizing brain substances.

With the low voltage current, like galvanism, much work is being done in the European institutions today in varying conditions of brain injuries and cerebral infections, to the benefit of the patient. Berguignon, of Paris, has done quite remarkable

work in the mental cases so prevalent in Paris in Salpetriere.

Dr. Frank H. Walke: I wish to thank the gentlemen for their discussion.

In answer to Dr. Tenney's question as to the autopsies of these cases, one case died within four or five hours and the other died about twenty-four or forty-eight hours after injury. They were compensation cases, oil field workers for the Standard Oil Company, and they were injured in the field and were brought to me at Shreveport to find out whether or not death was due to a brain condition or some other condition, so they might know whether to pay the compensation if it was due to injury.

In one case, a small nut about a half inch in diameter, weighing less than three ounces, I think, dropped about 54 feet from a derrick and struck this patient in the head. There was practically nothing there in this particular case as far as a scalp injury was concerned. However, they knew that he was hit in the head and the history was that he was hit along about two o'clock in the afternoon. He went home and went to bed that night and reported for work the next morning. He worked all day, went to a picture show the following night, and as he came home he reached down to unlace his shoes, and as he did he fell over, dead.

In the other case a block of two-by-four fell three or four feet, glanced off the shoulder of a fellow workman and hit this man on the head. He fell over, was knocked out and did not regain consciousness at all. It looked as though he would regain con-

sciousness, and they said he muttered and talked a little bit, but they took him to the bunkhouse and he died there very shortly afterwards. He was brought to Shreveport the next day. The findings were extremely interesting due to the fact that there was no fracture, there was no hemorrhage, as we see it, there was no blood vessel broken with a clot or anything that could have proved pressure there, but there was a peculiar, thick, tenacious exudate that was straw colored but not exactly the color of blood serum, neither was it clear like the spinal fluid.

Both of them had this peculiar exudate, and it was bulging, showing pressure in the cranium.

I was willing in both cases to tell the Standard Oil Company that the brain injury was due to this trauma. I opened the chest cavity to examine the valves of the heart and they were found normal in both cases. When we saw the brain injury we concluded that was responsible for the death.

In regard to brain cases, I am very fond of brain surgery and have been very fortunate in a number of head injuries. When I first started we happened to have a man with Jacksonian epilepsy, and a plastic flap relieved his epilepsy. It got abroad among the negroes that I was curing negroes of fits who had been hit on the brain, and I had a number of cases where the transplantation was done. Of course, I enjoyed it because the more I got the more I could work in that field. My brain work has always interested me a great deal.

I have some cases of trauma with which I am using Berguignon's method of positive galvanism through the eyeballs to see what result we can get. Of course, there is the element of time and the element of calcium chloride. I have two electrodes, one fitting over either eye, and I put the other electrode over the site of the injury. The positive galvanism goes through the eyeballs, using a 1:500 calcium chloride solution instead of 1:200 as Dr. Berguignon suggests, and I really believe that I am getting some result. I have only two cases, however, and they are not entirely well, and therefore I didn't want to report those at this particular meeting.

I have three slides of interest which I would like to show, in which it is rather peculiar that we got three cases of fracture of the fourth cervical vertebra. One came into the office in June, another in July, and the third in August, and there was absolutely no paralysis of any kind in these cases. While they are not entirely industrial, yet they are rather interesting, and a series of three coming along, all happening to be of the cervical vertebra, is quite unique.

The first case is a man who went swimming and dived into shallow water. He remembered getting a jar, and he had a persistent headache for some time. Five weeks afterward he came to the office complaining of pain in his neck, so I immediately asked him about an injury, and he told me about diving. He was a good friend of mine, and I said, "Well, you have got a broken neck."

He was very much astonished when we had a radiogram taken and it was proved.

These cases had no paralysis whatsoever. All of them came in really with a self-diagnosis of neuritis, one cervical neuritis, another brachial neuritis, he thought, and the other, headache all the time.

Dr. O. H. Wolner (Eveleth, Minn.): Did you ever use any occupational therapy in connection with your practice in fracture work?

Dr. Walke: Yes. The Standard Oil Company have a large number of men working for them. If a man is injured in such a way that he can't go back to that job as a roughneck or roustabout or whatever they call him in the field, they fit him to some other position, and we try to rehabilitate him to do something else.

Dr. Wolner: I meant in regard to working while they are laid up. For instance, I saw a man with both femurs fractured, and he was lying in bed making baskets. He seemed to be very much interested in it, and he made \$22 a week on an average while he was lying in bed.

Dr. Walke: I have given them certain exercises that they can take while they are in bed if they have fractures, certain stretching exercises of the arms and chest if their legs are bound up, just for something to do, but all of my cases are compensated and money is no object in those particular cases.

Someone just asked me if there were any spasms of the neck muscles in these frac-

tures of the neck. There were not except in one; the first case I got had some.

The third case, a fracture, shows a slight fracture, with no displacement. This patient was given diathermy through small electrodes on either side of the fracture, and he complained only of pain in his muscles, and then he had some difficulty in swallowing. About the second treatment the pain in the muscles was gone. About the fourth or fifth treatment the difficulty in swallowing had disappeared.

Case No. 3 is the one that had the muscle spasm in the neck. He was a man sixty-eight years old. He complained of pain in his neck and shoulders, and he had a continuous headache. He had had a prostatectomy done, and we thought probably that was the reason he had pain in his neck, that it was probably a focal infection, because he had a great deal of pus in his bladder and prostatectomy was necessary. After his recovery from that he was referred to me for electrical treatment, thinking that he had neuritis. I examined him and asked for an x ray. You can see that the process is entirely eliminated. I asked him if he had ever had an injury. He said he had not. After the x ray I told him he was bound to have had an injury. He remembered that nine years previous he fell from the platform of a derrick about twelve feet and bumped his head, he said. He said he did remember lying around the bunkhouse two or three days, but he didn't stop work. He complained of headache more or less all

the time, but being a hard working man he had worked all these years without paying much attention to it. His headache got so bad that he was going around to doctors to get a diagnosis. It was laid to kidney trouble, and then he went to a urologist, who did the prostatectomy. Then he was referred to me for electrical treatment.

This fourth case is a most interesting one, with a fracture of the fourth cervical. It is the most difficult case in that he had a typical posture. His head was down and his shoulder was dropped, and he had had two accidents. He had first an automobile accident in which he was thrown to the top of the automobile. He paid no attention to that, and about three months later he was getting out of the bathtub when he slipped on the tile floor and struck a radiator. At that time he was rendered unconscious for two or three minutes, as far as he knew. He then sent for his physician and was put in bed for two or three days, but no x ray was taken. He got up, and it still gave him pain. Finally his pain was aggravated and he got worse instead of better, so he came to me with a self-diagnosis of neuritis. The x ray picture showed a peculiar condition. I can't see why there is so much displacement there without some pressure symptoms, but he did not have any.

After it had gone so long I did not think it was necessary to immobilize it. Diathermy was given, using small block tin electrodes on the side of the neck through and through. That relieved all of these cases under treatment.

RADIUM IN CANCER OF THE MOUTH*

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THERE is no doubt that there is an apparent increase in the mortality from cancer until it is nearly that of tuberculosis. This seeming increase in mortality is probably due to our more accurate means of diagnosis.

ETIOLOGY

In cancer of the oral cavity, the direct cause is some form of irritation. This irritation may come from ill-fitting plates and bridge work, not due necessarily to neglect on the part of the dentist, but to the failure of the patient to have the mechanical parts adapted to the changing contour of the jaws.

Again, the irritation may come from such agents as tobacco. It is a noticeable fact that when cancer of the buccal membrane occurs in a tobacco chewer, it is on the side where he holds his quid. We also find it among the snuff chewers of the South, where it is found predominately among women. It is their practice to slip the packet of snuff between the lips and the gums, and it is at this point where the original lesion is found.

It is also found that collections of food material between the teeth not only causes decay of the tooth structure, but also acts as an irritant to the mucosa.

Syphilis is also a forerunner of cancer of the mouth in many cases. Simmons (*Am. Jour. Roentgenology*, June, 1925. Vol. XLII, No. 6, p. 146) found a positive Wasserman reaction in 19 per cent of a personal series of cases and Quick found a positive Wasserman in 40 per cent.

In cancer of the tongue a gumma may have existed which has become or excited a cancer because of the continual irritation.

Some of these cases have come to me for final treatment. Frequently they had been treated by the family physician with specific measures, and, because there was a betterment in the general appearance, they failed to appreciate the real condition, and allowed the cancerous process to proceed, until when it finally reached me it was an advanced case.

Ultimate cure of cancer of the mouth depends largely on the early diagnosis, and it is safe to say that any sore in the mouth that does not heal in two weeks after irritation has been removed, must be looked on with suspicion and should be treated as a cancer. Of course, if there is also a positive Wasserman, antisyphilitic treatment must be instituted as well.

PATHOLOGY

Biopsy of cases of cancer of the mouth show that nearly all of them are of the squa-

*Read at the Fourth Annual Meeting of the American College of Physical Therapy, Oct. 19, 1925.

mous cell type. Simmons finds two types of mouth cancer. The first is the papillary type of relatively low malignancy and slow growth, which forms metastases comparatively late. The second type is the rapidly growing form which metastasizes early and is often incurable six weeks after its onset.

TREATMENT

And yet it seems that these rapid growing cancers are very amenable to the rays of radium, if a sufficiently large dose is employed. This dose must be large enough to attack the cancer cell, but not large enough to produce necrosis of the surrounding healthy tissue. I have found that in dealing with cancer of the lower lip a dose of 500 milligram hours for each square centimeter is a dose that will meet all requirements.

The advanced case of cancer of the lip has usually metastasized to the submaxillary and sublingual glands. If the floor of the mouth or the side of the tongue is involved, the same glands are affected.

It is a noticeable fact that in some of these advanced cases, radiation seems to hasten an enlargement in the above mentioned glands. This is sometimes due to lymphatic engorgement, and not to actual carcinoma metastasis. If treatment is begun in the early days of cancer of the lower lip, there is little likelihood of its metastasizing.

Leukoplakia: On the buccal membrane a patch of leukoplakia may have existed for some time or may have been treated with caustics. In either case, lack of treatment or the use of caustics is bad policy, for every case of leukoplakia is a forerunner of can-

cer and should be treated scientifically as soon as discovered. With the disappearance of these patches, which is readily accomplished, the patient can be promised freedom from cancer in that area. For patches on the buccal cavity, the application of radium is best accomplished by means of a teaspoon. In the concave surface of the spoon is placed some dental wax, and in this wax is imbedded several tubes of radium, amounting to 100 milligrams. On the convex portion of the spoon is placed three millimeters of lead to protect the tongue. The entire mass is covered by a rubber finger cot. The concave portion of the spoon is brought in contact with the lesion and the handle bent at the corner of the mouth and brought in contact with the outside of the cheek, where it is strapped securely with adhesive plaster. Using 100 mgms. as a dose, three hours for each patch is required. In the course of four or five days there will be considerable local inflammation, which will be followed in a week or so by a slough, which in turn is followed by scar tissue. When the patches are of recent origin and are thin, the removal of irritation, such as rough teeth or tobacco will in some instances effect a cure. But after observing a good many of these cases, I have found it is better not to trust to nature too much, but to get to work with a tried agent that will leave nothing to imagination. If 10 mgm. flat applicators are used, two hours is the time required.

Lip: The technique in applying radium to a lip cancer is simple. A strip of lead is first bent to fit as a saddle over the lip. In

the concave surface is placed some dental wax. One hundred milligrams of radium in tubes is placed in this wax and over all is drawn a finger cot. The apparatus is now ready to set over the lip, where adhesive strips hold it securely in place. If the lesion is small, it may be necessary to make a fenestra in a piece of lead to protect the surrounding good tissue. The lead piece, with the fenestra, should be rubber covered, also. This is to prevent injury from the secondary beta rays that come when the gamma rays strike metal.

If the lesion has hard edges and there is considerable ulceration, the area should receive 400 to 500 milligram-hours per square centimeter of lesion. The reaction will be at its height in about three weeks, when resolution will begin to take place. If the lesion is in the corner of the mouth, radium needles, each containing 10 mgms. of radium, can be inserted in the growth, entering the needle just a little outside the actual margin of the growth. If the growth is only a little over a centimeter in size, these needles should be left for six hours. When laying the tubes in contact with the growth in the lead saddle, the upper lip must be protected by at least three millimeters of lead.

Tongue: In the treatment of cancer of the tongue, the most satisfactory applicators are radium needles. These should be introduced a little outside the zone of the actual lesion and pointed toward the center. Four or five needles, each containing $12\frac{1}{2}$ mgms. of radium, should be placed equidistant from each other around the lesion for a

period of twenty-four hours. If the lesion is two or three centimeters in diameter, this dosage will cause a destruction of the growth.

I have seen cases treated by 1,800 to 2,000 milligram-hours, but I was not satisfied with the large amount of necrosis produced. Cases treated with an excessive dosage are very slow to heal.

Glandular Involvement: If the submaxillary or submental glands are palpable at the time of treating the tongue lesion, it is my practice to use a radium pack over these glands, employing 200 mgms., elevated three centimeters above the skin for twenty-four hours. If the glands are quite large and distinct, I find it better to implant 4 or 5 radium needles for a 1,200 milligram-hour radiation.

PROGNOSIS

When cancer attacks the base of the tongue the prognosis is not as good as when it occurs on the side. Frequently the tonsil on the corresponding side is affected in conjunction. Cancer affecting this region of the tongue usually metastasizes to the cervical chain. After introducing needles well down into the base of the tongue, edema of the glottis sometimes follows; but in my own work I have never seen it so desperate as to require a tracheotomy. As a rule, cold compresses applied to the neck will cause a subsidence of the edema.

The cervical metastatic glands are treated in the same manner as the submaxillary or submental.

RADIUM IN CANCER OF THE MOUTH

Resection of carcinomatous glands does not seem to be followed by as good results as we could hope for.

CONCLUSION

The points that I wish to emphasize are as follows:

First. Early diagnosis of the malignant lesion.

Second. The selection of a suitable dose sufficient to kill the cancer cells.

Third. Care against a dose that will produce necrosis in the surrounding good tissue.

DISCUSSION

Dr. A. F. Tyler (Omaha, Neb.): The paper discussed very thoroughly the treatment of marked malignancies by the use of radium. There is just one little addition which I would like to make, one which has proven so helpful in the use of radium by myself that I would like to pass it on for what it is worth. As Dr. Hanford said, we must cover the radium applicators with rubber in order to shut off the secondary radiation which arises from the metal filters. Rubber tubes, rubber gloves, and things of that kind are used by different men. I have found it exceedingly helpful to buy rolls of automobile tube repair gum. You can cut that into any shape to fit any kind of applicator, and by simply compressing it with the finger or an instrument the rubber becomes firmly adhesive and waterproof.

Dr. Arthur E. Joslyn (Lynn, Mass.): I do not want to discuss the paper, for I do not know enough about it. But I would like to ask some questions.

Dr. Hanford spoke about using 100 milligrams of radium on the concave portion of a spoon in leukoplakia of the buccal membrane. I want to ask if he screened out all the beta rays or if he thinks they are of any use.

In cancer of the lip I want to ask him if there is any disadvantage in inserting radium needles below the lesion. That is a thing which I have always done with success. I would like to know if there is any disadvantage in that method over his.

Dr. C. W. Hanford: The silver containers cut off a portion of the beta rays. With the usual tube applicators, we get considerable effect from the beta rays. We get more in the flat applicator when it is applied to leukoplakia. I cannot give you the exact percentage of the beta rays that are allowed to go through in the silver form of applicator, but they are of course reduced somewhat.

In regard to the introduction of needles below the actual border of the lesion, there is absolutely no harm in doing that. In fact, it is quite the custom in my work, and I find in the work of others, too, to introduce the needles outside of the actual line of the lesion. That outside tissue must be attended to and must be made to react against the further invasion of the cancerous cells.

NEW EQUIPMENT

LANGMUIR TUBE: PATENT GRANTED*

GENERAL ELECTRIC COMPANY,
Schenectady, N. Y.

A basic patent for the modern vacuum tube, used extensively in radio, x ray work and in repeaters used in long distance telephony, has just been granted the General Electric Company by the United States patent office. This tube was invented by Dr. Irving Langmuir, assistant director of the General Electric research laboratory, in 1912, but because of contests the patent was not granted until today.

The tube is characterized by its hard, constant vacuum, by its freedom from visible discharge and other gaseous effects and by its steadiness and reliability in operation. It can be made in large sizes operating with 50,000 volts and upward, as well as in the smaller sizes such as are used in the ordinary home radio receiving sets.

Prior to Dr. Langmuir's invention, radio and x ray tubes were of what is now known as the soft variety; that is, they glowed and acted erratically and unreliably except when used on exceedingly low voltages. Dr. Langmuir's invention, by removing this se-

vere voltage restriction, has made possible practical radio as we know it today.

The patent applicator has had an eventful career. Following his invention of the new tube in 1912, Dr. Langmuir spent months in thoroughly testing the invention. He filed his application in the patent office in Washington in 1913 and made the invention known to the world by papers read before scientific societies and by descriptions of the tube in scientific and popular publications. The new tubes were used for radio work by the French army early in the war and were soon in regular use in radio and x ray work in this country.

The patent application, however, did not enjoy such immediate success. The patent office examiner passed the application for issue in 1916, but this action was revoked before the patent was issued in order to permit another who had in the meantime applied for a patent on this invention to contest Dr. Langmuir's right to a patent in what is called an interference proceeding.

On the declaration of the interference, Dr. Langmuir's opponent attempted to show that the invention was not patentable. On account of the unusual importance of the

*Received for publication December, 1925.

Dr. Irving Langmuir, assistant director of the General Electric Company, upon whose invention of the three element tube several years ago the General Electric Company has just been granted a basic patent, on radio and x ray tubes and long distance telephony repeaters.

invention the patent office departed from its usual practice and permitted elaborate testimony to be taken on the question of patentability, including even testimony, taken in England, on behalf of Langmuir's opponent of a world famous British scientist.

After the United States went into the war the secretary of the navy requested the commissioner of patents to suspend proceedings because the full time of both parties was required upon war work of great importance to the government. After the war, testimony was resumed, and the merit of the invention was eventually sustained by the patent office, after an attack for which there are few precedents in vigor or in skill. Thereupon the contest became one to determine whether Dr. Langmuir or the later applicant was the first inventor, and more testimony had to be taken by both parties to establish their dates of invention. The examiner of interferences adjudged Dr. Langmuir the first inventor. On appeal to the examiners-in-chief the decision was again in favor of Dr. Langmuir. On further appeal,

the assistant commissioner held in favor of the later applicant. But on still further appeal to the Court of Appeals of the District of Columbia, the assistant commissioner was reversed and the court, agreeing with the examiner of interferences and the examiners-in-chief, found that Dr. Langmuir was the prior inventor. The appeals, though diligently prosecuted, were not terminated until June of the present year.

Dr. Langmuir is a world known scientist and inventor. Among a large number of other scientific and practical inventions made and patented by him, the best known is probably the Type C, or gas-filled, Mazda incandescent electric light.

The application of Dr. Langmuir's vacuum tube invention to x ray tubes was the invention of Dr. William D. Coolidge, another world known scientist-inventor working in the research laboratory of the General Electric Company at Schenectady. The Coolidge x ray tube, embodying the inventions of Dr. Langmuir and Dr. Coolidge, is now in operation in all hospitals and x ray laboratories.

EDITORIAL

ARCHIVES OF PHYSICAL THERAPY, X-RAY, RADIUM

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A. F. TYLER, M. D.
Managing Editor

THE PAST, THE PRESENT AND THE FUTURE*

GENTLEMEN: It is indeed a great pleasure to preside on this auspicious occasion. I feel deeply indebted for the great honor conferred on me by the election to high office. I believe that no honor can come to a professional man that is the equal of such recognition by his associates, especially in the broad field of national organization where men are better able to be measured on their merits, when freed from the petty local jealousies that often surround them. Our associates in their clearer and maturer judgment are more apt to measure us justly, especially in associations where politics and log-rolling form no part of the program. Thus there falls upon one's shoulders a grave responsibility to labor and up-

build that which has been entrusted to his care.

It has seemed to me that at this particular stage of physical therapy it might not be amiss to briefly review the past, to take a view of the present and to express a hope for the future.

The organization and conduct of a body of men such as this is no easy task. It is full of labor and requires hearty cooperation and team-work to make it a success. Those of us who have lived so long in the field of physical therapy know all the difficulties that surround a body of men trying to push forward a legitimate line of therapy.

Back in the past the physiotherapist had to rank with a potpourri of unrecognized and unqualified men, men without standards, men without ethics, men with no object save their own personal gain and aggrandizement.

I am perhaps, alas, one of the old men in this line of therapy. Those of you who are new can hardly grasp what it means to go back over the trail thirty-five years and recall all of the struggles, all of the difficulties, all of the contumely, all of the dissatisfaction that the introduction of a new therapy brought to one who was honestly and cleanly and ethically using it.

*Presidential address at Fourth Annual Meeting, American College Physical Therapy, Chicago, October 20, 1925.

As I have often said, this line of therapy was a great deal like the great trail that led out of Kansas City in "the days of long ago." From there started the great caravans of the home seeker and the West builder, and all along the trail that wound in its sinuosity over prairie, across stream, through mountain gorge into the great land of promise of the West, on either side might be seen the rotting timbers of wagons, the broken felloes, the iron rims, and here and there the bleached, picked skeleton of some unfortunate man or woman who had either died by the roadside from exposure or from the fatal shaft of some Indian warrior.

In the same way, if you went through the offices of many of those old physicians, you might find skeleton after skeleton in the shape of unused faradic batteries, the psychically effective but still and speechless static, each one of them bearing silent but nevertheless unquestioning testimony to the destructiveness of non-constructive thought.

I have gone over the trail, have fought, bled and suffered and, in looking back, it seems to me that you have indeed an easy time, that you have fallen in pleasant places where there are many flowers and much sunshine as against those who in the good old days, with horny hand swung the ax that felled the tree, rooted up the stumps, cultivated the soil and planted the seed that is this day bearing its fruit in oh! so many wonderful ways.

In those days we were beset on all sides by faker and charlatan, later by cultists, but we were strong in the sense that we were

right. As the great bard of Avon has said, "Thrice armed is he that has his quarrel just," we went on and on, struggling and struggling, and yet maintaining a high, strong, ethical character through the years.

It took *men*, in those days, to use physical therapy. It was the stigma of dishonor to use your hands. Disease was too oftentimes measured by the pad and pencil and not by what gifts there were in the hands of men.

Then there came a change. All great changes seem to be accompanied by cataclysmic disturbances, and so, sitting in its smug, self-satisfied, self-laudatory and so-much-better-than-thou position, the American medical profession was awakened with a tremendous jar from this state of complacency by a great war, and it took war, with its horrors, war with its blood, war with the great cost of men and money and life to awaken the medical profession to the fact that ordinary surgery and ordinary medicine were not sufficient by any means to meet indications that were constantly arising. And so, copying, to a certain extent, the foreign physicians, the American profession began to use physical measures in the treatment of disease. It is indeed a pleasure to feel that in many respects the American profession is forging rapidly ahead of its European confreres.

Today no fair thinking man, in my opinion, can gainsay for one minute that there does not reside in these measures true worth and true value.

You have not lived through the day when if you were successful you obtained your success through suggestion, but it was an interesting fact, difficult of explanation, that some of the most persuasively suggestive in the profession were unable to obtain those same results without these measures. There has been a great deal of farce written about suggestion. If you do not think so, take some neurological case with a morbid idea and see how much persuasion will do to get rid of it. You will find it one of the most difficult things imaginable. Patients, perhaps, can be persuaded, but it was very difficult to persuade medical men.

We have many problems ahead of us today. The greatest problem that is presented is ourselves. There are literally hundreds of men today who are not intelligently prescribing physical therapy, but who are using it, and there is a tremendous difference between the prescription of physical therapy and the using of it. These men are the men who do not prescribe physical measures based on anatomical and physiological conditions, on known pathology, on diagnosis, on a true recognition of the physiological activities of the measures they use, but they are the individuals who "give treatments." I want you to draw the distinction plainly and clearly that there is every difference in the world between the man who intelligently prescribes physical measures and the man who gives treatments and has his treatment for this and his treatment for that.

Another great necessity of the present day is the standardization of the instruments

that we use. This is a matter that can be most certainly and accurately accomplished, for the physicist and the physiologist in combination with the clinician should have very little trouble in reaching a standard by which our apparatus may be constructed and we may know just exactly what we are obtaining from each and every piece that we use.

A crying need is the standardization, to a certain extent, for it can be only to a certain extent, of treatment. Of course, treatment is always modified by the particular individual that one has in hand at the time, but a general standardization of therapy is something that is very badly needed in this day and generation.

What must we do in the future? First, clean house. That means cleaning out all of those who will not adhere to the fact that we are doctors and not physical therapists, that we are practitioners and not mechanics. I am not a physical therapist. I decline to be so classified. I am a neurologist and an internal medicine man. If I choose to use within my specialty any particular form of therapy, and I care not where it comes from if it comes with reasonable degree of accuracy, I have the right to use it, because it is not what you use that constitutes quackery, but it is how you use it. Is there a medicinal remedy within the broad range of the pharmacopoeia that has not been in the hands of the most arrant quack? Are we to give up the great medicinal remedies of this profession because some cultist or some quack chooses to use them? No! No man would expect that.

So let us begin to look to ourselves and see that we are first of all practicing medicine.

Then let us raise the standard. We must all the time be looking upward. How many of you remember the lines of that beautiful poem:

"I shot an arrow into the air,
It fell to earth, I know not where."

If we do not shoot high, it will soon in its trajectory pass into the earth. Shot high, no man knows where it will fall. That may be idealism in medicine, but if we have no idealism we have nothing toward which we can strive.

We belong to the fifth estate. Perhaps some of you have had the privilege of seeing a meeting of the British Commons and the House of Lords. I happened to be in the House of Lords the night when Mr. Gladstone declared war against Egypt in one of those marvelous, simple, but eloquent speeches of his. In those days they believed that there were the lords spiritual and the lords temporal and the commons, and then one Englishman speaking said, "We are the three estates, but, gentlemen, yonder is the fourth estate," pointing to the reporters' gallery. His words have come true, because the press is today the great fourth estate in this world of ours. And we are, as Arthur Little says, the fifth estate, the scientific men. Upon our shoulders has fallen the mantle and the burden, to our hands the torch has been thrown, and we must carry on.

"We are those who must have the simplicity to wonder, the ability to question,

the power to generalize, the capacity to apply. That is the company of workers, thinkers, practitioners, those who advance science seeing the inner harmony of things and what nature meant, bringing knowledge to the unthinking, carrying forward intelligence through trained intelligence." This is our work, and we first, last and always must be physician, internist, practitioner, using physical methods as part only of our armamentarium, ever remembering that in their use we carry with it the highest idealism and the most perfect practice.

EDWARD REMY, JR., M. D.

The death of Edward Remy illustrates the constant dangers to which the x ray practitioner is subjected. On March 18th, while working on his x ray machine, Dr. Edward Remy's body shunted across two bare electrical connections, resulting in his electrocution.

Dr. Edward Remy, Jr., was born in Mansfield, Ohio, in 1881. After his preliminary training in the grade and high schools of that city, he began the study of medicine—graduating from the Cleveland College of Physicians and Surgeons in 1903. He had practiced in Mansfield, Ohio, since his graduation.

His life has always been marked by the noble desires of building and serving a strong medical organization in his county, state and nation. He was actively serving as Secretary of the Richland County Medical Society at his death. He had also served as president of this same society in 1924;

and was an active member of the Ohio State Medical Association, and a Fellow in the American Medical Association.

It is the coordinated efforts and ideals of such conscientious and far-seeing men that forms the foundation sufficient to retain the time-honored recognition of our profession.

U. S. CIVIL SERVICE EXAMINATION

The United States Civil Service Commission announces the following open competitive examination:

PHYSIOTHERAPY AIDE
PHYSIOTHERAPY PUPIL AIDE
PHYSIOTHERAPY ASSISTANT

Receipt of applications for the positions listed above will close January 9, February 13, March 13, April 17 and May 15, 1926. The dates for assembling of competitors will be stated on the admission cards sent applicants after the close of receipt of applications.

The examinations are to fill a vacancy in St. Elizabeth's Hospital, Washington, D. C., and vacancies in the Field Services of the Veterans' Bureau and the Public Health Service.

The entrance salaries for physiotherapy aide range from \$1,020 to \$1,680 a year, for physiotherapy pupil aide from \$720 to \$1,500 a year, and for physiotherapy assistant, from \$1,320 to \$1,600 a year. Physiotherapy aides and physiotherapy pupil aides in the Public Health Service receive quarters, subsistence and laundry free of cost.

The duties of physiotherapy aides consist of administering physiotherapy in its several branches as massage, electrotherapy, hydrotherapy, mechanotherapy, thermotherapy; active, passive, resistive and assistive exercises and remedial gymnastics; keeping daily record of the work and progress of every patient coming under direction and treatment; and making the required reports of the activities of the reconstruction work in physiotherapy.

The duties of physiotherapy pupil aides are the same as those of physiotherapy aide, except that they are pupils under the supervision and instruction of the chief aide in all the work above mentioned.

The duties of physiotherapy assistants consist of administering to special cases the treatments of physiotherapy, as massage, electrotherapy, hydrotherapy, thermotherapy, mechanotherapy; active, passive, assistive and resistive exercises; remedial gymnastics; keeping a daily report of the work in progress on each patient under the appointee's direction and treatment; and making the required reports of the activities of the reconstruction work in physiotherapy.

Full information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or the secretary of the board of U. S. civil service examiners at the postoffice or customhouse, any city.

AMERICAN BOARD OF OTOLARYNGOLOGY

An examination was held by the American Board of Otolaryngology on October

19, 1925, at the Cook County Hospital, Chicago, with the following result:

Passed	120
Failed	23
—	
Total examined	143

The next examination will be held in Dallas, Texas, on April 19, 1926. Applications may be secured from the Secretary, Dr. H. W. Loeb, 1402 South Grand Boulevard, St. Louis, Missouri.

AMERICAN CONGRESS ON INTERNAL MEDICINE

The Tenth Annual Congress on Internal Medicine will be held at Detroit and Ann Arbor, week of February 22-27, 1926.

The Congress is devoted to amphitheatre, bedside and clinical laboratory demonstra-

tions as well as to symposia dealing with modern phases of internal medicine. Distinguished guests from abroad, Canada and the leading clinics of the United States will occupy prominent places on the program. Four days will be devoted to the work at Detroit and on one day the society will be the guest of the University of Michigan at the newly opened eleven hundred bed University Hospital.

All physicians who are interested in internal medicine and who are members in good standing of their local and national societies are cordially invited to attend the Congress.

Hotel headquarters will be at the Book-Cadillac in Detroit. Information regarding reduced railroad rates, program, hotel accommodations, etc., may be secured from the Secretary-General.

ABSTRACTS *and* REVIEWS

DISEASES OF THE CHEST IN CHILDREN: A SYMPOSIUM

TUBERCULOSIS

The Examination Center for Tuberculous Children. Correspondence J. A. M. A., 85:623-624, Aug. 22, 1925.

There is no method that is 100 per cent in medicine. In obtaining a diagnosis and treating any condition, every possible medicinal measure should be used according to its indications and contra-indications.

This was clearly demonstrated in the department for the examination of tuberculosis in children in the Vienna Polyclinic. Although any child may be sent there, a suspicion of tuberculosis is first realized by the school, physician, public welfare physician, private physician, etc. Of the 1,021 children examined, 26 per cent showed no evidences of tuberculosis, 61 per cent were found to be infected, 5 per cent demonstrated a pleural affection, in 7 per cent there was tuberculosis of the lungs or hilum and only 1 per cent showed genuine pulmonary tuberculosis.

"All children examined were subjected twice to the tuberculin test. Twenty-six per cent were in good health. The children in whom the tuberculin test was negative were given also a roentgenologic examination. In this connection, it may be remarked that not only does the roentgeno-

logic examination result negatively in certain instances in which the tuberculin test was positive, but that, vice versa, the tuberculin test was occasionally negative in the presence of an unequivocal tuberculous pleuritis. Special heed should, therefore, be given to such differences between the results of the roentgenologic examination and the tuberculin test. In 11 cases a pleuritis could be established only by the roentgenologic examination. In 20 cases only clinical symptoms were observable. In 16 cases, clinicians and radiologists were agreed as to the diagnosis. A primary focus was visible in the roentgenogram in 22 cases, or five per cent of the infected cases in which a roentgenologic examination was made. In the rare cases of "tertiary" tuberculosis in children, the clinical findings are much more significant than the roentgenogram. Moist rales are heard, although no corresponding dark area in the roentgenogram can be seen. The moist rales are very characteristic and important—also when the roentgenologic test is negative—and especially at the apex of the upper and lower lobe. In 72 cases there were rather small but sometimes somewhat large foci in the lung tissue or in the glands of the hilum. In 22 of these 72 cases, the clinical findings were negative, the condi-

tion being revealed only by the roentgenologic examination.

In nine cases rather severe tuberculosis existed, although the roentgenologic evidence was not marked—but in such cases an increased prominence of the hilum alone must not be taken as proof of the presence of tuberculosis. Dr. Peyrer, who published the summary, emphasized that for the diagnosis of pulmonary tuberculosis the roentgenologic findings with moderately enlarged hilum proved nothing whatever; even calcareous shadows in the hilum must be interpreted very cautiously. No absolute reliance can be placed on the roentgenogram; the clinical findings and the tuberculin reaction are needed, since the way to errors is open. Roentgenologic evidence of an enlarged hilum is frequently found in noninfected children, and hence is not to be relied on."

Such is the opinion of one man, unsigned, and possibly an entire clinic. Our readers who have had the opportunity of examining roentgenographically the chests of children supposedly suffering from tuberculosis and in whom a diagnosis was either made or refuted, we would be glad to hear from you, substantiating or refuting the conclusion made.

Childhood Tuberculosis and Its Relation to the Tuberculosis Problem. Edson W. Glidden, M. D., J. M. A. Georgia, 14: 245-248, June, 1925.

Tuberculosis occurs much too frequently in children and is so often overlooked. The general concensus of opinion is that the initial tuberculous infection usually, if not

always, occurs in childhood, although it may not become manifested until adult life is reached. It may be manifested in the infantile, juvenile or adult type.

Of course the diagnosis of tuberculosis in children is far from an easy task. One must be guided by the symptomatology presented and influenced by the positive signs that may be present. The roentgen ray findings are of considerable value and it is upon them that much of the diagnosis is based. One or more of the following conditions may be found:

1. Prominent bronchial trunks with a definite beaded appearance or nodular in outline, extending from the hilum.

2. Enlarged lymph glands, varying in number and density, imbedded in the thickened tissue of the hilum. One or both hila may be involved.

3. Diffuse shadows of varying intensity throughout the hilus. Occasionally there are cloudy masses with irregular outlines projecting into the adjacent tissue due to involvement of the deep parenchyma.

In children the von Pirquet test is of greater value than in any other stage of tuberculous infection.

In the treatment of these young patients, the author suggests hospitalization. These children yield to sanatorium treatment even more readily than do adults. Sunlight and artificial heliotherapy do wonders in these cases if properly regulated.

Diagnosis of Tuberculosis in Early Life. William M. Taylor, M. D., J. Oklahoma State M. A., 18:233-235, October, 1923.

Tuberculous infection occurs irrespective of age or origin. Its manifestations are not consistent, the symptoms varying with the patient affected. The diagnosis made upon the symptomatic manifestations of the disease is unreliable. The physical signs are often lacking in the early stages. The von Pirquet reaction is valuable at this time.

There is often a history of direct exposure, which is very valuable.

The x ray examination of the chest at frequent intervals is the third means by which the diagnosis of tuberculosis is most definitely made. Noting the much more manifest shadowing of the hilum and calcified nodules in cases giving history of direct exposure leads one to feel more justified in the dependence placed on the x ray of the chest. Repeated x rays of the chest aid in differentiating between tuberculous adenitis and the more transitory form seen following acute respiratory infections. "To be more conclusive the picture of the chest should be repeated from time to time, for it is by the follow-up pictures and watching the general condition of the child that he may be safeguarded by way of improving environment and the early detection of any suspicious symptoms. The interpretation of a competent and experienced roentgenologist are of much value."

Heliotherapy in the Treatment of Tuberculosis. Horace LoGrasso, M. D., *Therapeutic Gazette*, 49:539-552, August, 1925.

After a rather brief historical sketch, reviewing the development of heliotherapy in

the treatment of tuberculosis, Dr. LoGrasso considers rather extensively Rollier's career and relationship to this therapeutic measure.

The method that has been developed at the J. N. Adams Memorial Hospital is a direct outgrowth of Rollier's method:

First day: The patient, reclining on a bed and dressed only in trunks and with head and eyes protected, is taken to the sunporch. His body is covered with sheets or blankets down to his feet, which are exposed and isolated for periods of five minutes during the day with intervals of about an hour.

Second day: Each isolation period of the feet is increased to ten minutes, and during the last five minutes of each period the sheets are drawn back to the knees, thus giving the legs from ankle to knee three five-minute exposures.

Third day: The feet are irradiated for fifteen minutes at each period. The isolation time of the part from ankles to knees is increased to ten minutes, and during the last five minutes the thighs are exposed and insulated.

Fourth day: Each of the three insulation periods is as follows: Feet, 20 minutes; ankles to knees, 15 minutes; thighs, 10 minutes; abdomen, 5 minutes.

Fifth day: Each insulation period of each part previously irradiated is increased by five minutes, and the chest receives its initial exposure of five minutes each period.

This daily increase in the length of the irradiation periods is kept up until on the twelfth day the longest-exposed part receives a total of three hours, the exposure

periods being for the feet, 60 minutes; ankles to knees, 55 minutes; thighs, 50 minutes; abdomen, 45 minutes, and chest, 40 minutes. From this day on to the sixteenth, the isolation period of the feet remains 60 minutes, while that of the other parts keeps increasing at the same rate, until the 60-minute period limit is reached by each one in turn. On the seventeenth day the change is made from three 60-minute periods to two 90-minute periods, one in the morning and another in the afternoon. If contraindications, such as fever, poor general condition, etc., present themselves, the time interval may be shortened. The anterior and posterior surfaces should receive the same amount of radiation, the total exposure being divided equally between the two surfaces. Another point, when the gradual increase is being made with the exposures, the arms should be down to the sides and their exposure should vary with the anatomical level being treated.

By way of conclusion the author emphasizes the following points in his discussion:

1. With the present knowledge of etiology, portal of entry and dissemination of tuberculosis justifies the opinion that social "surgical tuberculosis" is only a localized manifestation of a general constitutional disease, the primary focus of which is in the lung or lymph node, and that the disease must be treated as a whole and not its manifestation only.

2. Any measures, whether radical or conservative, that tend to lower the resistance of the patient and aggravate or reactivate the disease, or that may deprive the patient of those forces that tend to build up the body

resistance, should be looked upon with disfavor. Rest, fresh air and sunshine have been, and are, our mainstay in the treatment of pulmonary tuberculosis, and if this holds true in the pulmonary type of tuberculosis it also holds true in the extra pulmonary.

3. Operative procedure does not remove the cause, but tends to aggravate or reactivate the primary focus in the lung or lymph node; also, by attempting to remove the localized disease area, likewise break down the wall of granulation and connective tissue which nature so kindly provides as a protection to the surrounding normal structure; thus it also opens up new areas to infection and increases the possibility of a generalized tuberculosis.

4. Operative procedure favors ankylosis and thus destroys the functions of a joint, while heliotherapy favors the preservation or reestablishment of function in a joint.

5. Operative procedure is justified only:
(a) In those cases in which in spite of heliotherapy and the resulting good general physical condition the local lesion has not shown any satisfactory improvement. (b) To correct the deformities developed during the course of treatment in spite of all efforts to prevent them. (c) To provide stability of an arthrodesis in a flail and useless articulation. (d) To evacuate abscesses, and this only by aspiration or a small incision when the pus is very thick. (e) In renal tuberculosis of the advanced stage, or where there is considerable destruction.

If surgery must be resorted to, it is best that it is preceded and followed by heliotherapy.

CHRONIC COUGH

Roentgen Ray Treatment of Chronic Cough in Children. Mulford K. Fisher, M. D., *Am. J. Roentgenol.*, 14:244-246, September, 1925.

A brief presentation of some of the major intrathoracic conditions in children amenable to the roentgen ray treatment is offered:

1. The thymus gland is enlarged to a sufficient size to cast a three cm. shadow in 42 per cent of normal infants. However, thymic dysfunction is a common disorder in infants, and there is for this condition the one real specific in pediatric medicine—the roentgen ray. Properly measured roentgen dosage on the thymus gland produces such a specific reaction that in the questionable cases it may be safely applied as a therapeutic diagnostic measure.

2. Status lymphaticus is a condition practically always associated with thymic disease and responds to similar therapy, even though it is administered to the gland itself.

3. A group of cases, clinically and etiologically the same, mediastinitis, peribronchial adenitis and hilusitis, are usually amenable to roentgen treatment.

4. There is frequently in children a chronic persistent cough, apparently a symptom without any evident underlying pathology, that is exceedingly troublesome. Such a condition occurs irrespective of enlarged or diseased tonsils or adenoids, tuberculosis, unresolved pneumonia, cardiac disease, pleuritic effusion, empyema and bronchial asthma. It is to be differentiated, especially by its long duration, from typ-

ical pertussis. The roentgen study is atypical. The treatment has been successfully limited to the roentgen ray. In a short eight month period the author has treated 22 children roentgenologically for this idiopathic cough. Twenty were entirely relieved in from two to five exposures. In only two was no relief afforded. Treatments were given in a subintensive dose weekly or at ten-day intervals. In two instances the cough subsided within forty-eight hours after the first treatment, and there has been no recurrence. The effect produced may be theoretically explained on the hypothesis of the influence of radiation on lymphoid tissue.

WHOOPIING COUGH

Treatment of Pertussis by Roentgen Ray. Lawrence W. Smith, M. D., and others. *J. A. M. A.*, 85:171-177, July 18, 1925.

In previous works it has been proven by one of the writers that a roentgen ray examination shows changes in the lungs characteristic of pertussis. These differ in a few essentials from the generally accepted picture of chronic bronchitis. The lesion consists in peribronchial thickening, which is most marked in the descending branches of the bronchial tree and especially in the mesial portions of the lower lobes. There is an accompanying enlargement of the mediastinal tracheobronchial lymph nodes, which is not quite the same in distribution as that noted in bronchitis of other causation. In addition, there is frequently a mottling of the lung shadow suggesting a

beginning infiltration or bronchopneumonia.

In the series of 850 cases recently treated by the writers roentgen ray proves that:

1. This means of therapy is of value in reducing the number and severity of the paroxysms and in shortening the course of the disease.

2. The majority of these cases, 750 in number, occur under seven years of age.

3. Most of the patients, 499 exactly, present themselves in the paroxysmal stage.

4. The greatest benefit of the roentgen ray treatment occurs in the paroxysmal stage, especially in the younger patients.

5. Early diagnosis can be established bacteriologically and by blood examination, as the disease is accompanied by a relative and absolute lymphocytosis in 80 per cent of the cases during the catarrhal stage.

6. Suitable vaccines made from organisms with an agglutination titer of 1:1600 plus are effective prophylactically, and if given in sufficiently large and frequent doses are of value therapeutically, suggesting that immunization is quantitative.

The study emphasizes the necessity of an early diagnosis and brings out the fact that such a diagnosis should be possible in a large majority of the cases through a combination of bacteriologic, hematologic and roentgenologic examinations in conjunction with an adequate history. It further suggests that the present quarantine regulations, which may vary widely in different towns within the same state as well as in different states are purely empiric and have no scientific foundation. It should be pos-

sible to unify the quarantine code in this respect, shortening the time of quarantine to not more than four weeks and in that way be able actually to enforce isolation, which at present is impossible. With adequate quarantine and early diagnosis, coupled with prophylactic vaccination of all exposed persons, the morbidity should be reduced very materially and with it the concomitant mortality. It should be possible to ultimately provide for the vaccination against whooping cough of all infants from the third to the sixth month of life. This immunity would probably last for one year. This prophylactic vaccination should therefore be repeated yearly for the first three or four years, which represents the years wherein practically the entire mortality of whooping cough occurs.

Further Observations on the Use of Roentgen Ray in Pertussis. Ralph D. Leonard, M. D., *Am. J. Roentgenol.*, 13: 420-423, May, 1925.

The original observations were published in the same Journal in 1924. In this report an intensive study has been made of 20 cases of uncomplicated whooping cough in addition to observing and treating 200 individuals in the outpatient clinic. The cases for intensive study were picked more or less at random from the outpatient clinic, choosing as early cases and as young children as possible. Eighteen of the 20 patients were three years of age or under; 17 were in the first three weeks of the disease, symptomatically. The average age of the patients was just under twenty-six months and the average duration of the disease at

the time of admission was about two and one-half weeks.

The patients received three routine treatments at forty-eight hour intervals. Further treatments were given if the symptoms still persisted. Some of the patients received as many as six or seven treatments. For the most part, the treatments were localized to areas covering the roots of the lungs, both front and back being treated at the same visit. The distance used was 16 inches, so that the total amount of radiation given in three treatments was nearly two-thirds of an erythema dose.

The most striking result of the treatments was the reduction of paroxysms. On the day of admission these 20 cases had a total of 288 paroxysms and at the end of two weeks the number of paroxysms had been reduced to 43.

The intensive study of these 20 cases resulted in arriving at the same conclusions that were drawn last year following the study of 400 cases, namely:

1. Roentgen radiation produces a diminution in the number and severity of the paroxysms in over 75 per cent of the cases, controlling particularly well the vomiting spells.

2. The somewhat increased dosage seems to give correspondingly better results.

3. The younger patients seem more susceptible to the benefits of roentgen radiation.

4. The roentgenographic findings would seem to indicate that the beneficial results may bear some relation to the effect which the roentgen rays have on the bronchial lymph glands.

ADENITIS

The Value of Radiation in Diseases of the Cervical Lymph Glands. Sanford Withers, M. D., Colorado M., 22:214-217, June, 1925.

In the treatment of pyogenic glands and sinuses, small doses of well filtered x rays are advocated by the author. Tuberculous glands react favorably to the same treatment. Hodgkins' disease should be treated with well filtered x rays from the pubes to the occiput, using the greatest penetration. The same applies to actinomycosis. Sarcomas of the melanotic, osteo-, chondro-, or fibro- types are radio-resistive. Undifferentiated types of sarcomas, such as the lymphosarcoma, the large and small round cell sarcoma, and the spindle celled sarcoma, are quite radio-sensitive. In the treatment of malignant cervical glands, internal as well as external radiation is used. Radium is implanted into and about the malignant glands either in the form of tiny glass spicules of emanation or metallic needles. All gland bearing areas are attempted to be given 100 per cent of an epilating dose of well filtered roentgen rays at 200,000 volts. Actual destruction of malignant glandular tissue is only brought about by the judicious use of implanted radium in addition to external radiation.

Radiotherapy in the Treatment of Tuberculosis Cervical Adenitis. Morris K. Smith, M. D., and J. Gardner Hopkins, M. D., J. A. M. A., 85:262-264, July 25, 195.

The author adequately expresses his view obtained from his therapeutic observations:

The object of our study of these cases was to estimate the value of the roentgen ray therapy as compared with excision treatment of tuberculous adenitis. Surgical experience, as expressed in such reports as that of Dowd, has shown that in early cases with a localized mass of involved nodes, excision gives a high percentage of cures. In such cases, permanent cure by the roentgen ray is frequently possible, but less certain. The possibility that large, firm nodes will break down under roentgen ray treatment must be considered. In choosing the method of treatment for such an individual case, the uncertainty and tediousness of radiotherapy must be weighed against the operative risk and resultant scar from operative procedure. There are, however, other cases (three-fourths of the author's series) in which complete excision is impractical or impossible, many of which can be definitely cured by the roentgen ray. It is not always a question of choice between surgery and radiotherapy, as incision and aspiration are surgical procedures, indispensable to the success in many cases in which the roentgen ray is used. Both surgery and roentgen ray therapy have important places in the treatment of tuberculous adenitis.

EMPYEMA

The Roentgen Aspect of Empyema in Children. John R. Carty, M. D., and Charles Liebman, M. D., *Am. J. Roentgenol.*, 14:215-218, September, 1925.

This paper is based upon a study of roentgenograms and clinical aspects of 225 cases of empyema and 100 cases of non-

purulent effusion covering a period of thirteen years. The anatomical contour of the diagnosis of the disease entity—empyema. The first and most obvious point is the size of the chest which permits a relatively small accumulation of pus. The outlines of the ribs are, therefore, seldom lost, and the costo-phrenic angles can often be outlined although a large effusion is present. Again, the contents of the thoracic cavity in the child are much more mobile than in the adult, so that a comparatively little accumulation of pus may displace the mediastinal contents. Likewise, asymmetry of the chest, and scoliosis of the thoracic spine are encountered.

In case of a suspected empyema in children antero-posterior films in the upright and prone positions are taken, using double intensifying screens. The spark gap and milliamperage are varied according to the size of the patient, and his ability to cooperate. Lateral views are not considered of much value.

In the adult, as already mentioned, one of the diagnostic signs of fluid is the obliteration of the costo-phrenic angle. This cardinal point does not hold true in children. The costo-phrenic sinus was visible in only 28 per cent of the series.

There is apparently no site of predilection. An attempt was made by the author to establish a relationship between the character of the shadow and the organism isolated, but without success.

Displacement of the heart was carefully searched for and found in 41 per cent of the series.

By way of differential, consolidation is the most important condition to be considered. However, at times consolidation and fluid occur simultaneously, and the overlying fluid may mask the consolidation. Consolidation by itself does not show asymmetry of the chest or scoliosis of the thoracic spine. The heart and mediastinal contents are not displaced away from the affected side. There is no fluid line along

the lateral wall. At times a pericardial effusion may cause a shadow bearing a striking resemblance to empyema. Bronchiectasis can cause a confusion, but only in the acute stages, when it resembles pneumonia. In massive collapse of the lung, the heart is displaced to the affected side and there is greater density of the shadow. Osteomyelitis is to be considered.

CUTANEOUS SYSTEM

Radium Therapy in Dermatology. G. Allen Robinson, M. D., *Am. J. Roentgenol.*, 14:130-133, August, 1925.

Keloids may be successfully treated by radiation methods, radium more effectively. The technique usually employed is to map out the keloid into areas (three by one cm.) which are slightly larger than that of the standard 50 mg. radium tube. The tube is screened with 1 mm. brass and 1 mm. hard rubber and is applied directly to each area for one hour. Small keloids respond to the implantation of 10 mg. platinum radium needles placed 1 cm. apart for a period of two hours. Radium applications are repeated every hour to six weeks until a smooth ribbonlike scar is obtained.

Cavernous angiomas two cm. or less in diameter may be treated by application of a 50 mg. radium tube screened with one mm. brass and one mm. hard rubber applied for one-half hour to each area, which is slightly larger than the tube. The insertion of 10 mg. platinum radium needles one cm. apart into the small angiomas for two hours will give quicker and equally satisfactory results. In cavernous angiomas more than

2 cm. in diameter 100 mg. radium at a distance of 1 cm. is applied to an area 2 inches square for two hours.

The author has treated 12 cases of pigmented moles with radium and the cosmetic results have been very satisfactory. For the treatment of melanomata more drastic and safer methods than surgery are advocated—endothermy or intensive irradiation.

Verrucae are radiosensitive and rarely more than one treatment is necessary to remove these lesions.

Epidermoid carcinomata of the skin are usually of the basal cell type. The implantation of 10 mg. platinum radium needles into the base of the lesion 0.5 cm. apart for a period of two hours is practiced by the writer. About six to eight weeks later a surface application of 50 mg. tube screened with 1 mm. brass and 1 mm. hard rubber is applied to the lesion for one hour. The gridiron effect left by the needles is thus smoothed out and the added gamma radiation effects of the carcinoma cells, which might not have been permanently destroyed by the first treatment. Epidermoid

carcinomata involving the cartilage of the ear or nose is probably best treated by endothermy.

Lupus erythematosus is fully benefited by radium treatment.

REFLEX

Common Causes of Shoulder Pain. P. F. Butler, M. D., and J. F. Elward, M. D., *Am. J. Roentgenol.*, 13:536-541, June, 1925.

The common causes of shoulder pain may be shown on a medium size film—a 10 by 12 being the size designated by the author. This film may be placed so as to include in addition to the shoulder joint, the lateral cervical region, the supraclavicular region, the upper portion of the thorax on the suspected side and the superior mediastinum. On this film, the following conditions may be demonstrated: caries or erosion of the cervical vertebrae, cervical ribs, cervical arthritis, calcified cervical glands, spur on the clavicle, opaque subdeltoid bursa, aortic aneurysm, apical tuberculosis, apical neoplasm, mediastinal new growths, Hodgkin's disease and demonstrable diseases or injuries of the joint itself. By such a film not sufficient information is obtained for a final diagnosis of any chest, mediastinal or cervical spinal condition. By such a film, sufficient information is gleaned to make one suspect the condition.

PSORIASIS

Psoriasis. Binford Throne, A. B., M. D., Long Island M. J., 19:339-341, September, 1925.

In this article a fairly composite and complete discussion of this cutaneous dis-

ease is given. Heredity seems to play a part in the causation of the disease. It is an acute or chronic inflammatory disease characterized by flat papules, or circumscribed plaques of varying size, covered with silvery white, imbricated scales, which have a predilection for the extensor surfaces, especially the elbows and knees. In a differential diagnosis, dermatoses, eczema, lichen planus and syphilis are to be considered. The treatment is not specific and there is no plan of treatment that will prevent recurrences. Internally, various alkalies, salicylates, arsenic, endocrine products and other preparations are used. Externally ammoniated-mercury, chrysarobin are advocated, the prescription advocated

Acid Salicylic	10
Chrysarobin	20
Oil of Rusci.....	20
Lanolin Anhydrous	25
Mix and add Green Soap.....	25

Sig: Apply once daily for one week, rub down with a simple fat and bathe.

X rays act very favorably when given in fractional doses once a week. The advisability of their use in a recurring affection like psoriasis is in the opinion of the author very questionable.

The ultra violet light is advocated by the writer. This means of therapy he believes should be used with impunity, considering it of great value. The same amount of good could, he believes, be done with sun baths.

MISCELLANEOUS

X Ray Therapy of Benign Conditions. C. Harvey Jewett, M. D., Clifton M. Bull., 10:148-154, December, 1924.

It is the purpose of the author to outline briefly the uses and limitations of the x ray in the field of benign conditions. In order to do this, the main subject was divided into two main heads: first, the treatment of skin conditions, and second, the treatment of deep seated lesions.

1. In the discussion of the skin lesions, the subject was again divided into those lesions which were more or less generalized, and those which were distinctly local and circumscribed.

A. In the more generalized lesions, such as eczema, psoriasis, acne vulgaris, lichen planus and pruritis, the fractional method of unfiltered radiation was employed, using a comparatively soft ray produced from a low voltage current and not using any aluminum or copper to filter out the soft rays. Usually one-quarter of an erythema dose is given at a time, five to seven days apart, and the course of the treatment is kept up for a number of weeks. As a rule the results obtained from this method are very satisfactory to both the roentgenologist and the patient, although changes may not appear for months.

B. In those lesions which are more or less localized, perhaps the one where the most brilliant results have been secured is in the treatment of (1) ringworm of the scalp, particularly in children. When treating these conditions the technique must be very exact and only a thoroughly trained roentgenologist is capable of administering it. It is necessary to give a sufficiently large dose at one treatment to cause all the hair to fall out in a few weeks' time. By the time the new hair grows in, the ring-

worm is cured. A similar reaction is obtained to the treatment of ringworm of the beard or finger nails. (2) Cases with sycosis of the beard have recently come under observation. They were cases of only a few weeks' duration and the results obtained with x ray were very satisfactory. The fractional method of unfiltered radiation was used. (3) Hyperidrosis is said to respond well to x ray therapy, particularly where the areas are in the soles of the feet and palms of the hands. (4) Warts, corns and small keratoses are often treated successfully. A single unfiltered dose of four times the erythema dose is given and the corns drop off, leaving normal skin in about three or four weeks. (5) The author considers epithelioma as superficial nonmalignant conditions. In their treatment x ray and radium are well established procedures. The lesions are first fulgurated with high frequency current and are then given a double unfiltered dose of x ray. X ray has been more successful in the treatment of keloids than any other method. (6) Angioma may be successfully treated by x ray, but as a rule are more easily treated by means of radium plaques.

2. In the treatment of the deeper lesions, one of the most important and one wherein x ray has played an important role for the past few years is the treatment of (1) hyperthyroidism. Holmes of the Massachusetts General Hospital considers x ray therapy of the thyroid gland to be equivalent to hemithyroidectomy, producing a reduction in the basal metabolic rate, but does not bring about a permanent cure. A subtotal thyroidectomy is the method of choice in

order to bring about as nearly as possible a cure which is as complete as the previous damage done to the heart and nervous system will permit. X ray does not seem to have the favorable effect on toxic symptoms in an adenomatous thyroid that it does have on simple thyroidism or exophthalmic goiter. However, the author considers the field of the x ray in the treatment of thyroid disease as a limited one and should be used chiefly in cases where operations are contra-indicated and possibly in some cases of postoperative recurrence or patients who refuse operation. It may be beneficial in preoperative treatment of severe cases in order to bring down metabolic rate, making an inoperable case operable. (2) The theory of the treatment of infected tonsils is that the x ray produces an atrophy of the lymphoid tissue, thereby opening up the crypts and allowing free drainage for the infection. In cases where operation is contra-indicated or refused, this method may be of definite value. There are many supporters of this practice, but there are also many who oppose it. (3) Where acute supuration is not present, the treatment of tuberculous lymph glands of the neck by x ray is of real value. (4) The diagnosis of an enlarged thymus in infants and children is largely dependent on the x ray examination and the treatment of this condition rests entirely with the x ray and radium. (5) In benign conditions of the uterus, the x ray has a large field of usefulness. The x ray treatment of uterine fibroids or fibrosis of the uterus has become thoroughly recognized. In menorrhagia occurring near the menopause from a fibrosis

of the uterus or small fibroids, the x ray is the ideal method of treatment and usually gives good results. For the production of an artificial menopause, the x ray exposures are indicated.

Deep Roentgen Ray Therapy of Mammary Carcinoma. William A. Evans, M. D., and T. Leuctia, M. D., Am. J. Roentgenol., 14:135-148, August, 1925.

The final outcome of mammary carcinoma depends on the manner of dissemination of the disease. Cancer spreads (a) by embolic invasion of the lymph vessels and lymph glands; (b) by extension in continuity in the way of slow permeation of the lymph plexuses around the primary lesion; and (c) by embolic invasion of the bloodstream.

Based upon the mode of dissemination, all breast carcinomas are divided into five groups. Groups 1 and 2 are operable; groups 3, 4 and 5 are inoperable. Group 1 is the small single, freely movable, primary carcinoma focus; group 2 is a large single or multiple carcinoma involvement of axillary glands; group 3 denotes an extension of the carcinoma to the supra and infraclavicular glands; group 4 includes the thoraxis (pleural, lung, mediastinal or thoracic cage) extension; group 5 classifies the abdominal or general carcinomatosis.

In the operable carcinomas the principle of treatment is that surgical procedure should be followed within ten to twelve days by postoperative roentgen therapy. The site of the primary lesion, the adjacent

glands and the microscopically permeated cancer area should be covered with radiation. The optimum dose in postoperative mammary carcinoma is 90-100 per cent S. U. D. The best way to administer the optimum dose is to use penetrating rays, which will allow a more homogeneous distribution of the rays within the tissues exposed. The technique consists of: (1) in using large portals of entry (20 by 20 cm.); (2) in increasing the skin target distance (70-100 cm.); (3) in using high filterage (1 mm. Cu plus 1 mm. Al.); and (4) by

treating the lesion as superficially seates, without using absorbing materials, such as paraffin, waterbags, etc., for the upbuilding of the patient. The question as to whether pre or postoperative radiation is to be desired is not yet settled.

In inoperable carcinomas, radiation should always be used. In instances apparent cures, and in all cases palliation and prolongation of life are obtained. Cancer immunity exists. Radiation therapy may increase this defense mechanism of the body.

OSSEOUS SYSTEM

PATELLA

Patella Partita. Hans Hellmer, M. D., *Acta Radiologica*, 4:137-144, May, 1925.

The author describes three cases of patella partita, a phenomenon which he believes to be to a formative anamoly combined with an inhibition in the ossification. In the article, the author reviews the theories regarding the cause of this anamoly.

TIBIA

Localized Periosteal Sarcoma of the Tibia. Fred F. Attix, M. D., F. A. C. S., *Northwest Med.*, 24:118-121, March, 1925.

In selected cases of localized osteogenic sarcoma of the extremity, the surgeon is justified in treating the case with the method of wide excision and cautery of the involved or suspected area, subsequently using radium, deep, heavy x ray therapy and other methods that may be helpful in the attempt to prevent local recurrence and

metastasis, especially to the lungs, early in the onset of this lethal disease.

By advocating a lesser surgical procedure than amputation, the early consent of the patient can readily be obtained. The growth can be examined for purposes or gross and microscopic diagnosis.

Finally, it is considered advisable to make early and frequent roentgenograms of the chest and extremities in suspected cases for immediate and future study, also submitting them for expert interpretation and advice, thereby preventing unnecessary amputation of the involved extremity.

CARPUS

A Rare Case of Injury of the Carpus: Dorsal Dislocation of the Multangulum Minus. J. Frank, *Acta Radiol.*, 14: 281-284, June, 1925.

The writer states a case of dorsal dislocation of the lesser multangulum, a similar

case, he states, not having been described in caused by the patient colliding full force literature as yet. This dislocation was with the handlebar of his cycle against a lamp post.

The writer describes the position of the lesser multangulum by the various movements of the hand. In gripping the shoulder, the hand is in adduction and ulnar flexion, and the thumb in opposition and flexion; a position in which the dorsal ligament is quite tense. The position of the lesser multangulum has become more free, and is not checked at the back of any bone. With the help of a diagram it is shown how, according to the principle of the parallelogram of forces, the lesser multangulum is bound to be dislocated at the back.

MISCELLANEOUS

Un Cas de Chondromatose Unilaterale. J. W. F. Jansen, M. D., *Acta Radiologica*, 4:133-136, May, 1925.

A case of unilateral chromatosis observed in a nine-year-old girl is reported. All the definite tumors are situated on the left side, while on the right side only a few small suspicious patches are evident. The pathological tissue microscopically shows cartilaginous cellules of myxiomatous type. The fibrous tissue is completely lacking. In the middle of the cartilagenous masses cellules of bone marrow and blood vessels are seen.

An examination of the body shows a distinct asymmetry. But since the left side of the body is less developed than the right side, the restrained development of the left side of the face should be expected.

ENDOCRINES AND SPECIAL SENSES

THYMUS

Investigation of Thymus Stimulation by Roentgen Rays. Maurice Lenz, M. D., *Am. J. Roentgenol.*, 13:226-234, March, 1925.

The numerous experiments of the author as far as this series is concerned all point to one conclusion: that the theory stating that the hypofunctioning thymus can be stimulated by exposing to the roentgen rays in fractional dosages of an erythema intensity is incorrect. Much more work should be done on this subject before attempting to accept or reject a theory that has influenced many apparently successful clinical results.

Radiation of the Thymus in Infantile Eczema. Jos. P. Costello, M. D., *J. Missouri State M. A.*, 22:398, October, 1925.

Spasmodic croup and sudden death have long been attributed to thymic enlargement. Recently thymic asthma has been described and has been cured or aided by the roentgen ray.

The tendency of infants with eczema to develop asthmatic bronchitis has been noted by many pediatricians. The author, after a routine x ray examination in all cases of facial eczema in infants accompanied by asthmatic bronchitis, found that a number of these cases had an unmistakably enlarged thymus.

The average physical findings noted were (1) a tendency to obesity, (2) a delay in development, (3) a general adenopathy, (4) enlargement of the tonsils and adenoids, (5) a widening of the sternal dullness on percussion, and (6) a widening of the tracheal breath sounds.

The roentgen findings were not enumerated in this article, but the author concluded:

1. The thymus is a *probable* cause of certain types of facial eczema.

2. Facial eczema and asthmatic bronchitis in early infancy are each a part of one disease.

3. A reduction of the thymus by means of the x ray is a means of improving and oftentimes curing this symptom complex.

SELLA TURCICA

A Roentgenographic Study of the Sella Turcica in Abnormal Children. Murray B. Gordon, M. D., F. A. C. P., and A. L. Loomis Bell, B. S., M. D. *Endocrinology*, 9:265-276, July-August, 1925.

Studies were made of the contours of the sella turcica in 64 abnormal children. The findings were compared with those found in a similar examination of 104 normal children. It was found that the shape of the sella does not differ significantly in normal and abnormal children. The type of disorder is not correlated with the shape of the sella. Round or oval shaped predominate both in abnormal and normal children and flat sellas are the least frequent.

The formation of the sella is not influenced by any of the diseases studied. As in the normal series, there was found no

relationship between the shape of the sella and the size of the head.

EAR

Clinical Value of Artificial Light in Otitis Media. Abraham R. Hollender, M. D., and Maurice H. Cottle, M. D., *Clin. Medicine*, 32:593-601, September, 1925.

The treatment of otitis media continues to be a serious otological problem. The application of light therapy to these conditions has met with beneficial results. The apparatus and principles involved in their application are important factors in the success of radiant energy therapy. The absorption of the radiant energy follows penetration with the longer wave lengths. When this energy is absorbed into living tissues, it is converted into heat or calories—and this brings about an activation of cellular metabolism—locally over the irradiated area, and distally through vasometer changes that follow hyperemia.

This radiant energy is best transmitted through clearly transparent glass which yields the maximum effect of deep therapy light. It has been employed early in cases of scarlet fever and measles showing normal drum membranes, as a preventive measure against otitis media. Early treatment offers the most favorable opportunities for arresting the trouble and preserving the hearing.

The use of ultra violet energy in chronic, purulent otitis media has given very favorable results. Fluorescent compounds augment the effects of the light rays. Heroic doses of ultra violet rays are frequently in-

licated according to the authors, but should be administered very cautiously.

General ultra violet exposures are often of great value to favor body metabolism.

The quartz rays are destructive. Light energy causes contraction of the protoplasm and acts directly upon the blood, increasing thereby its oxygenating power.

TECHNIQUE

ROENTGEN INTERPRETATION

Some Misinterpretations of X Ray Plates and Fluoroscopic Screens. Carl E. Koenig, M. D., *Northwest. Med.*, 24: 136-139, March, 1925.

In roentgenology, technique and interpretation play major roles. It demands the greatest skill of the radiologist to get the least amount of distortion, the greatest degree of detail, the desirable amount of contrast and the proper radiographic density, but far more important is the ability to correctly diagnose what is depicted upon the plate.

It should be the aim of every conscientious professional man to make a correct diagnosis in every case wherein it is possible, and when he calls into service the commercial x ray photographer he has not used the best means at hand to arrive at a correct diagnosis.

All sorts of misinterpretations of injuries of the bones of the extremities are being made by men inexperienced in reading x ray plates. The commonest mistake in this phase is the interpretation of epiphyseal lines for transverse fractures.

In the gastro-intestinal tract many of the barium meals are deceptive, requiring the utmost skill and scientific diagnostic ability of the radiologist. Spasmodic contraction in all portions of the intestinal tract are most misleading and give rise to all forms

of incorrect diagnosis. Stricture or carcinoma of the esophagus, malignancy or ulcer of the stomach, or ulcer of the duodenum are all examples of errors of diagnoses where no pathology exists.

Calcified mesenteric lymph glands, phleboliths, have deceived many into believing that they are dealing with renal calculi or gallstones, and undissolved cathartic pills composed of blue mass, or other metallic purgatives may be the cause of mistaken diagnoses.

The examination of the chest from a roentgenological standpoint is a most difficult problem. The x ray plate of a normal lung shows a light network which radiates outward from the hilus that indicates the position of the bronchi, blood vessels and lymphatics. People in middle age enjoying the best of health frequently show lung markings that in a younger individual would designate active disease.

In the roentgenologic diagnosis of pathology in the dental plates, there are several primary lesions to be learned. The mental foramen is generally found between and just below the apices of the lower bicuspid teeth. The shadow cast upon the dental film looks not unlike the shadow of a chronic periapical abscess and is sometimes diagnosed as such, when in fact the tooth condemned is sound and healthy.

The x ray and fluoroscopic screen are not valuable because of what is depicted, but because of what is interpreted and diagnosed. Every field of medical practice that assists materially in raising the percentage of correct diagnoses deserves the whole-hearted support of the entire profession.

IONIZATION CHAMBER

A Theoretical and Experimental Study of the Small Ionization Chamber. Hugo Fricke, Ph.D., and Otto Glasser, Ph.D., *Am. J. Roentgenol.*, 13:453-461, May, 1925.

The results of the experiments of the authors are summarized adequately in their conclusions:

1. The ionization current produced in chambers whose dimensions are small as compared to the range of a photo-electron in air is independent of the size and form of the chamber, and is directly proportional to the volume. This relation for chambers with a volume of approximately one c.c. holds for the radiation conditions ordinarily used in roentgen therapy.

2. The ionization currents produced in small chambers of different materials may be presented by the equation $I = C_1 + C_2 N_{\text{eff}}^3$ in which N_{eff} is the effective atomic number of the material of the wall.

3. The graphic representation of this relationship gives a straight line, if the third powers of the effective atomic numbers of the materials are used as the abscissas, the respective ionization currents being the ordinates. The calculation of the constants C_1 and C_2 or the construction of the straight line for any quality of radiation may be made by measuring the ionization currents in two

chambers of different materials and plotting the results in the manner described.

4. The intersection of the straight line with the ordinate determines that part of the total ionization in a small chamber which is due to the recoil electrons.

5. A chamber with walls of the same effective atomic number as atmospheric air (7.69) will always give an ionization current which is proportional to its volume, and equal to the current produced in the same volume of an infinitely extended air space.

6. It is proposed to define the unit for the roentgen ray intensity by means of such a chamber.

Standardization of the Roentgen Ray Dose by Means of the Small Ionization Chamber. Hugo Fricke, Ph.D., and Otto Glasser, Ph.D., *Am. J. Roentgenol.*, 13:462-464, May, 1925.

It is suggested that a small ionization chamber of a material with an effective atomic number equal to that of atmospheric air (7.69) be used as base for the experimental definition of the standard unit R (one roentgen) of the roentgen ray dose.

In this article the construction of such a small air chamber is described.

This standard chamber is compared with ionometers made from different commercial substances.

The erythema dose was measured with this standard chamber and found to be 1,400 R for fairly hard rays.

ROENTGEN STANDARDIZATION

Epilation in Mice as a Biological Standard for Determining Roentgen Ray Dos-

age. **Henry H. Hazen, M. D., and Laurence C. Milstead, M. D., Am. J. Roentgenol., 13:451-452, May, 1925.**

The fact that in the treatment of tinea tonsurans the minimum epilation dose for the human scalp is an absolutely fixed and certain quantity, hence should prove an ideal biological check, caused the authors to experiment on mice. They found the epilation time in young male mice for either the radium or roentgen rays to be absolutely fixed and constant. In experiments upon 20 mice, complete epilation was precisely six times that necessary for human beings.

If this method proves successful, numerous practical advantages will accrue:

1. Radium can be standardized upon animals instead of upon human subjects.

2. If it be proven that there is a difference in the output of Coolidge tubes they can likewise be standardized.

3. It is possible that mice can be used to check up the accuracy of the various electrical devices for high voltage machines.

4. The validity of the inverse square of distance law for filtered radiation can be proven or disproven.

5. The biological accuracy of MacKee's arithmetical formula can be tested.

6. Any possible effects of ultra violet radiation, combined with irradiation, can be proven.

A Portable Instrument for the Measurement and Registration of X Ray Intensity. Rolf M. Sievert, M. D., *Acta Radiologica*, 4:129-132, May, 1925.

For the purpose of controlling x ray intensity, an instrument has been constructed consisting of a large ionization chamber, a galvanometer, and a compensation chamber. A registration apparatus can be fixed to this instrument.

BOOKS RECEIVED

This column is devoted to acknowledgment of the books received. Such acknowledgment must be regarded by the sender as sufficient recognition of the courtesy until time and space permit selections to be made for review.

A COMPEND OF GYNECOLOGY. By *William Hugh Wells, M. D.*, Late Assistant Professor of Obstetrics in the Jefferson Medical College; Asst. Obstetrician in the Maternity Dept. Jefferson Medical College Hospital, etc. Fifth edition. Revised and enlarged by *William B. Harer, M. D.*, Instructor in Obstetrics in the Univ. Pennsylvania, etc. Cloth. Price \$2.00. Pp. 371, with 167 illustrations. Philadelphia: P. Blakiston's Son & Co., 1925.

LANDIS: A COMPEND OF OBSTET-

RICS. Especially adapted to the use of medical students and physicians. Tenth edition. Revised and edited by *Clifford B. Lull, M. D.*, Instructor of Obstetrics, Jefferson Medical College, Philadelphia; Asst. Obstetrician to the Maternity Dept., Jefferson Medical College Hospital; Attending Physician, Dept. of Gynecology and Obstetrics, Philadelphia General Hospital, etc. Cloth. Price \$2.00. Pp. 283, with 84 illustrations. Philadelphia: P. Blakiston's Son & Co., 1925.

RADIOLOGICAL EXAMINATION OF MALE URETHRA. By *G. L. S. Kohnstan, M. R. C. S. (Eng.), L. R. C. P. (Lond.)*,

Late House Surgeon to the Urological Dept., King's College Hospital, London; *E. H. P. Cave*, M. D., B. S. (Lond.), M. R. C. S. (Eng.), L. R. C. P. (Lond.), D. M. R. E. (Camb.), Late Resident Radiologist, King's College Hospital, London. With a preface by *Sir John Thomson-Walker*, O. B. E., M. B., C. M., F. R. C. S. Cloth. Price \$5.50. Pp. 115, with 64 figures and plates. New York: William Wood & Co., 1925.

PRINCIPLES OF ORTHOPEDIC SURGERY FOR NURSES. By *James W. Sever*, M. D., Asst. Orthopedic Surgeon, Children's Hospital, Boston; Instructor Orthopedic Surgery, Harvard Medical School; Orthopedic Surgeon, Cambridge Hospital, Cambridge, Mass., etc. Cloth. Pp. 203, with 136 illustrations. New York: Macmillan Co., 1925.

HAND-ATLAS OF CLINICAL ANATOMY. By *A. C. Eycleshymer*, B. S., Ph.D., M. D., Dean of College of Medicine and Director of Dept. Anatomy, College of Medicine, University of Illinois; and *Tom Jones*, B. F. A., Director of Anatomical Illustration and Instructor in Anatomy, College of Medicine, University of Illinois; with special dissections by *O. E. Nadeau*, B. S., M. D., Associate in Surgery, University of Illinois. Cloth. Price \$11.00. Pp. 424, illustrated with 395 line drawings, mostly in color. Philadelphia: Lea & Febiger, 1925.

RADIOGRAPHY. A manual of x ray technique, interpretation and therapy. By *Charles D. Enfield*, M. D., F. A. C. P., Roentgenologist to St. Anthony's Hospital and Norton Memorial Infirmary, Louisville, Ky. Cloth. Price \$10.00. Pp. 299, with

194 illustrations. Philadelphia: P. Blakiston's Son & Co., 1925.

STUDENT'S GUIDE TO OPERATIVE SURGERY. By *Alfred T. Bazin*, D. S. O., M. D., Assistant Professor of Surgery and Clinical Surgery, McGill University. Assisted by *F. A. C. Scrimger*, V. C., B. A., M. D.; *F. J. Tees*, M. C., B. A., M. D.; *L. H. McKim*, M. D.; *I. McL. Thompson*, B. Sc., M. B., Ch. B. (Edin.) of the Depts. of Surgery and Anatomy, McGill University. Cloth. Pp. 126. Montreal: Renouf Publishing Co., 1923.

HUGHES' PRACTICE OF MEDICINE. Thirteenth edition by *R. J. E. Scott*, M. A., B. C. L., M. D., Fellow of the New York Academy of Medicine; Fellow of the American Medical Association; Formerly Attending Physician to the Demilt Dispensary and Bellevue Dispensary, etc. Cloth. Price \$4.00. Pp. 810, with 63 illustrations. Philadelphia: P. Blakiston's Son & Co., 1925.

COMPEND ON DISEASES OF THE SKIN. Seventh edition revised and enlarged by *Jay F. Schambery*, A. B., M. D., Professor of Dermatology and Syphilology, Graduate School of Medicine, University of Pennsylvania; Director of the Research Institute of Cutaneous Medicine, Philadelphia; Ex-President American Dermatological Association, etc. Cloth. Price \$2.00. Pp. 316, with 119 illustrations. Philadelphia: P. Blakiston's Son & Co., 1925.

COMPEND OF GENITO-URINARY DISEASES AND SYPHILIS. Including their surgery and treatment. Fourth edition, revised by *Charles S. Hirsch*, M. D., Urologist to the Jewish Hospital; Mt. Sinai

Hospital, and Eagleville Hospital for Consumptives, Out Patient Dept., Philadelphia. Cloth. Price \$2.00. Pp. 337, with 44 illustrations. Philadelphia: P. Blakiston's Son & Co., 1925.

TEXT BOOK OF ORTHOPEDIC SURGERY. For students of medicine. By *James W. Sever*, M. D., Assistant Orthopedic Surgeon, Children's Hospital, Boston; Instructor in Orthopedic Surgery Harvard Medical School; Orthopedic Surgeon, Cambridge Hospital, Cambridge, Mass., etc. Cloth. Pp. 363, with 199 illustrations. New York: Macmillan Co., 1925.

HIGH FREQUENCY PRACTICE. For practitioners and students. By *Burton Baker Grover*, M. D., Author of the Handbook of Electrotherapy; President of the Western Electrotherapeutic Assn., 1919-1920; Fel-

low of the American Electrotherapeutic Assn., etc. Cloth. Price \$6.00. Pp. 530, with 73 illustrations. Kansas City: Electron Press, 1925.

LA HAUTE FREQUENCE EN OTORHINO-LARYNGOLOGIE. Diathermy, high tension, electro-coagulation, etc. By *Leroux-Robert*, Ancien Assistant d'oto-rhino-laryngologie de la Salpêtrière. Preface by Professor D'Arsonval. Paper. Price 15 francs. Pp. 166, with 74 illustrations. Paris: Masson & Cie., 1925.

THE EVOLUTION OF MODERN MEDICINE. A series of lectures delivered at Yale University on the Silliman Foundation in April, 1913. By *Sir William Osler*, Bart., M. D., F. R. S. Cloth. Pp. 243, with 107 figures and plates. New Haven: Oxford University Press, 1921.

BOOKS REVIEWED

CLINICAL FEATURES OF HEART DISEASE. An interpretation of the mechanics of diagnosis for practitioners. By *Leroy Crummer*, M. D., Professor of Medicine, University of Nebraska. Cloth. Price \$3.00. New York: Hoeber, 1925.

This is a timely treatise on the clinical study of heart disease that comes at a time when we are all looking for some machine that will classify the heart lesions for us and prescribe the treatment.

The author speaks from a wealth of experience over a number of years and brings out many valuable suggestions for aiding one in the diagnosis of heart lesions.

The first two chapters deal with auscultation and percussion. Here the author brings

out many interesting facts, many of which are commonly overlooked by the most of us. Under the chapter of auscultation, there are many sounds enumerated that the average ear does not hear. Dr. Crummer has been able to unmask a lot of the mystery regarding murmurs. He shows that just because a person has a murmur that he is not necessarily incapacitated for the duties of ordinary life.

Under the chapter of cardiac irregularities, a sincere effort is made to penetrate the haze which surrounds this subject. This chapter bears frequent rereading by those who attempt to treat hearts.

The treatment of the diseased valves shows again the result of the author's long

years of experience and such points as the snappy first sound of mitral stenosis, and the heavy apex beat of mitral insufficiency, with the systolic murmur transmitted to the axilla are rightly emphasized.

In the chapter on decompensation, much valuable information is given on how to detect the early signs of heart failure. These signs are present in a great many people, and should be looked for in this day of physical examinations.

Under treatment, the block system of digitalis, four days of digitalis and four days of diuretin is emphasized. Digitalis and morphine are the two drugs advocated for treatment. Proper emphasis is accorded rest.

Cardiac Neurosis is a departure from the beaten paths and is an intelligent attempt to separate the organic lesions from the hysterias.

The book is well written and reads easily and the arrangement is pleasing. Surely we can expect more books from this author.

E. L. MacQuiddy, M. D.

OPERATIVE GYNECOLOGY. Third edition. By *Harry S. Crossen*, M. D., F. A. C. S., Professor of Clinical Gynecology, Washington University Medical School and Gynecologist in Chief to the Barnes Hospital and the Washington University Dispensary, etc. Cloth. Price \$12.50. Pp. 677, with 837 illustrations. St. Louis: Mosby, 1925.

This book marks an epoch in American text publication. It is what one would expect to come from Dr. Crossen.

The text is clear, concise and very readable; but it is the detail in the discussion

that really makes this book a real valuable text for teaching purposes. It is not merely a picture book, as are so many volumes dealing with operative technique, but uses these portraitures to supplement the accurate detailed descriptions. As a text alone, disregarding the valuable illustrations, this work is an outstanding contribution to gynecological literature.

The illustrations give us not only the principle of the operation but also the steps and technique as well. They are clear, well drawn and the points desired to be shown are given the proper emphasis. The only book that compares with this in illustrations is that of Weibel, who was Wertheim's former assistant.

To me, this is the best book printed in English adequately covering the field of gynecological surgery. It is the type of book that you wish to read and study several times and to keep on your desk ever ready to serve as a reference for detailed points. Naturally the reader does not agree with all the methods elaborated and suggested, but in disputed points the author describes two or more procedures, presents their advantages and disadvantages and allows you to draw your own conclusions. It is in this respect that this volume, the third edition, has become more valuable both to the student and practitioner. In conditions wherein various methods have been recommended and applied, as in retrodisplacement and in prolapse, the personal views and practices of the author have been so graciously elaborated. And in incorporating this new material, more than ninety new

illustrations have been added to sufficiently carry the detail home.

In order to keep abreast of the times, every surgeon should possess this text. In order to have a thorough understanding of the various gynecological operations and a clear concept as to the preferable methods for the various conditions, it is essential that every senior medical student have access to or possess this volume. We will probably have other volumes on this general plan prepared covering other surgical subjects, but to Dr. Crossen we must give credit for presenting an outstanding text, where both the descriptions and illustrations clearly set forth the points under discussion and describe minutely the various operative steps.

Chas. F. Moon, M. D.

GYNECOLOGY FOR NURSES. By *M. J. Seifert*, A. B., M. D., F. A. C. S., Attending Surgeon and Gynecologist, Columbus Hospital, Chicago; *formerly* Professor of Physical Diagnosis and Anesthesiology, University of Illinois; Adjunct Professor of Operative Surgery, University of Illinois. Cloth. Pp. 325, with 115 illustrations. New York: Appleton, 1925.

This new book is intended for the use of student nurses and has attempted to include "not only the nursing aspect of modern gynecological therapeutic methods together with the rationale of treatment, but also the most recent developments in the preparatory and postoperative management of surgical cases with the accepted technique as applied to the province of the trained nurse."

In the compilation of this text so much has necessarily been concentrated into such a small space that even the more important phases are given only a paragraph or two. One of the most common causes bringing the woman to the gynecologist is functional disorders of the generative organs. In their consideration the author has painfully limited his discussions.

The text is, however, very easily read and an effort has been made to use the terms that are easily understood by student nurses who as yet have only a limited medical vocabulary. Unusual words and conditions are described under various scientific and common names. A great help in this regard will be found in the section devoted to medical terminology.

The newer developments of physiotherapy and radiology are considered in another part after first reviewing the laws governing their application and interpretation.

Another most valuable addition, although migrating away from the chosen path, is the chapter on dietetics. Here diet lists and dietetic recipes are tabulated without attempting any caloric or percentage calculation. Some valuable "liquid," "light," "general," etc., menus are given, together with standard Diabetic, Typhoid, Ulcer and Obesity diets.

Very good illustrations are used throughout the book to supplement the text and help clarify the subject matter described. We have here a text book which will find its greatest use as a supplement to a course of lectures by a staff man and as a reference book for use by the training school.

Chas. F. Moon, M. D.

A TREATISE ON THE DISEASES AND INJURIES OF THE RECTUM, ANUS AND PELVIC COLON. J. Rawson Pennington, M. D., F. A. C. S., Proctologist to Columbus Hospital, Veterans' Hospital No. 30 and U. S. Marine Hospital; Past President American Proctological Society, etc. Cloth. Price \$12.00. Pp. 933, with 2 plates and 677 illustrations. Philadelphia: P. Blakiston's Son & Co., 1923.

This most valuable text fills a long recognized deficiency. More than twenty years have elapsed since the publication of James P. Tuttle on Proctology, and though no startling discovery has been made on this subject during this interval, the general medical and scientific advances which necessarily have had a strong influence on subsidiary subjects, have had their influence on the development of this specialty.

This treatise is an amalgamation and a critical evaluation of the most important facts expounded in periodical literature—the judgment being controlled by the author's own experiences. These facts are organized in a most available manner, and references are given to those authorities whose writings have been chosen.

After a brief historical introduction of the subject, the discussion is divided into three main headings: I, General Principles of Proctology; II, Diseases and Injuries of the Rectum and Anus; and III, Diseases and Injuries of the Pelvic Colon. Prefacing each chapter is a short account of our knowledge regarding the different affections and the measures for relief.

In discussing the *principles of proctology*, the splanchnosomatic funnel, the key to the

text, serves as a nucleus about which the material is presented. The preparation and examination of the patient and a general scope of the rectal diseases is discussed.

A full account of the anatomy of the parts involved precedes the next two general considerations of the subject. In *diseases and injuries of the rectum and anus*, congenital conditions, as malformations, malpositions, etc., are first discussed. Trauma, in the form of wounds, ruptures, foreign bodies, etc., play their role in proctology. Inflammations present themselves in many different ways, pruritis, fissure and fistula, abscess, ulcer, cryptitis, papillitis, proctitis or periproctitis; or specifically as an infective process, granulomata—syphilitic, tuberculous or actinomycotic. New growths and protrusions may be the general heading under which the various benign and malignant tumors, cysts, prolapsus and hemorrhoids may be included. The treatments applied for the amelioration of these various disorders are detailed.

Diseases and injuries of the pelvic colon may be given somewhat the same general classification, a complete consideration of the pathological conditions occurring being considered in detail.

While it is usually traditional to include in a treatise of this type all the obsolete interventions, the author has minimized this material and has presented only those methods which have a direct bearing on the immediate development of the modern procedure. These, together with the historical data included, constitutes all that could possibly be considered as accessory. With the entire scope of medical literature as the ref-

erence, a reproduction of the achievements of those who have been and others who are masters in proctology as the basis of the presentation, controlled and organized by the careful judgment of a recognized authority in this field, this text should be a valuable contribution to the armamentarium of the modern practitioner.

OCULAR THERAPEUTICS. By *Doctor Ernst Franke*, A. O. Professor of Ophthalmology and Chief of the Second Eye Clinic at the University of Hamburg. Translated by *Clarence Loeb*, A. M., M. D., Oculist to the Michael Reese Hospital and Head of the Department of Ophthalmology of the Michael Reese Dispensary, Chicago. Cloth. Price \$3.50. Pp. 183. St. Louis: C. V. Mosby Co., 1925.

In the author's preface the purpose of this text is given: to offer to the beginner only a list of the remedies which may be used, and to the practitioner a quick survey of the methods of treatment from which to select the one which his own experience has shown to be appropriate for the special case.

Although the correct diagnosis of the condition presented must be made by the oculist and the pathology underlying the lesion should be clearly understood, the translator considers it equally important to be able to furnish the relief sought. His point is well taken.

To adequately survey the methods of treatment which have been used in the various ocular conditions which confront the practitioner, the material has been presented generally, locally and specifically.

In the *general treatment*, tuberculin occupies the principal mode of combatting tuberculosis, aided by mercury, sun baths and radium. Syphilitic treatment comprises the same mercury, salvarsan and iodine as indicated in the disease elsewhere in the body. Serotherapy, organotherapy and paraspecific therapy receive somewhat shorter notice, for their value in ophthalmology has not yet been determined accurately. Ray, light and physiotherapy are reviewed, their indications and various methods of application being discussed for those diseases in which they have been valuably used. Such a discussion is more at length than customary in this country. An encyclopediac pharmaceutical and brief therapeutic discussion of medicinal uses are given for the numerous drugs which have been used in treating diseases of the eye. Hydrotherapy is discussed.

The same general scheme is used in the consideration of *local treatment*: mechanical, counterirritative, light, ray, local medical, serotherapy and electrotherapy being discussed.

The *special part* takes up anatomically each of the pathological conditions with which the oculist has to deal. For example, under lids, edema, chalazion, dacryocystitis and the numerous other pathological conditions that may exist are listed along with their various methods of therapy.

This text is no encyclopedia; but is rather an epitome, into which has been cruelly condensed an organized mass of ocular therapy.

NEW AND NONOFFICIAL REMEDIES, 1925, containing description of the

articles which stand accepted by the Council on Pharmacy and Chemistry of the American Medical Association on Jan. 1, 1925. Cloth. Price \$1.50. Pp. 461. XL. Chicago: American Medical Association.

Physicians are constantly being informed of the latest additions to the armamentarium of drug therapy, and are always eager to accept authoritative medicinal aid. Yet they have no way in which to judge the efficacy of the drug unless they base their judgment on the manufacturer's claims or experiment upon their patients.

New and nonofficial remedies is the publication which the Council of Pharmacy and Chemistry annually provides the American medical profession with disinterested and critical information concerning these proprietary medicines offered the profession which the Council considers worthy of recognition. Nonproprietary medicines which the Council on experimentation have found worthy of consideration are discussed.

This material has been encyclopediacally arranged, many of the drugs presented in classes, as the mercury, iodine and silver compounds; radium and radium salts, medicinal foods, etc. Briefly the chemistry, actions, uses, dosage and various modifications of these drugs are given.

According to the preface, numerous articles were omitted either because they did not conform to the principles and rules that govern the recognition of articles, or because they were off the market. Other articles have been added, among which may be enumerated medicinal dyes, glandular therapy, digestive enzymes, insulin, silver preparations, milk preparations, mercurio-

chrome, etc. A description has been added of radon—radium emanation.

For the busy general practitioner who must base his opinion for the use of these new preparations on the advertising pamphlets of the manufacturers or the probable beneficial or detrimental action noted by fellow practitioners, this book should be welcomed.

THE CHEMICAL ACTION OF THE ULTRA VIOLET RAYS. By *Carleton Ellis and Alfred A. Wells*. Pp. 362, with 85 illustrations. Price \$5.00. New York: Chemical Catalog Company, 1925.

This text is the outgrowth of numerous requests concerning a series of articles that appeared in the *Chemical Engineer*.

After elaborating upon the nature of the ultra violet radiation and discussing its sources, both natural and artificial, protective glasses and filters are considered. Observations were made on the photochemical mechanism and of the reactions of gases in ultra violet rays, these various photochemical and photolytic reactions being elaborated in detail.

The inauguration and growth of the dye industry has increased the usefulness of ultra violet radiation in determining the fastness of dyes. Bleaching of oils occupied the attention of others.

The effect of the ultra violet rays on halogenation reactions, particularly chlorination, has been of much benefit as a public health safe water supply problem. Further interest in the ultra violet rays has been stimulated by the work of British scientists on the synthesis, through the action of this agent, of carbohydrates and pro-

teins. Perhaps this led or influenced the later work which is of the most important application of any agent. Observations have proven that this form of radiation is capable of either creating or activating vitamins of inactive substances in certain food products which are normally deficient in these essential compounds, so that they assume the properties of the substances normally containing these active components. This activating power of the ultra violet rays has intimately associated it as a recognized therapeutic measure for deficiency diseases, among which stands particularly rickets and tuberculosis. The ultra violet light has also been proven to have a definite bacteriocidal activity.

Although the contents of this work has been confined largely to the more strictly chemical effects of ultra violet radiation, its careful perusal impresses one of its specific reactions and emphasizes the necessity of a thorough understanding of its chemical activity before undertaking its therapeutic application.

INTERNATIONAL CLINICS. Vol. II. Thirty-fifth Series. Edited by *Henry W. Cattell*, A. M., M. D., and numerous collaborators. Cloth. Price \$2.50. Pp. 311, with 66 plates and illustrations. Philadelphia: J. B. Lippincott Co., 1925.

The contents of the text is divided into seven portions:

I. The editor, Henry W. Cattell, reviews the medical portraits and medallions modeled by R. Tait McKenzie.

II. In the monograph, I. W. Held presents a discussion of the present status of *affections of the kidney*.

Rudolph Matas reviews the *systemic or cardiovascular effects of arteriovenous fistulae* based upon his surgical experience.

The diagnosis and management of *dysentery* is considered in symposium form by Frank G. Haughwout and George R. Callender.

III. The division on Diagnosis and Treatment presents first some notes on *new growths of the digestive tract* from the work of Thomas R. Brown.

The symptomatology and diagnosis of *cystic neoplasms of the ascending mesocolon* are discussed by Charles Greene Cumston.

The question of the *prognosis in medical practice* is one in which Christian G. H. Baumler tells his personal experiences.

The patient or his disease, presented by James J. Walsh, is well worth the attention of every reader.

In a short clinical talk John F. Erdmann outlines the method of making an *abdominal diagnosis*, stressing the importance of the x ray.

In case report form, James W. Bruce considers *intracranial hemorrhage in the newborn*.

A consideration of the relation of *food to health and vitality*, by Harvey W. Wiley, concludes the section on Diagnosis.

IV. The section on Medicine contains but one article, Lewellys F. Barker's lecture on *chronic infectious arthritis*.

V. To introduce the subject of Surgery, Fred H. Albee discusses and illustrates *reconstruction surgery*.

A series of unusual case reports is presented by Charles Goodman.

The various types and treatments of *abscesses about the anus and rectum* are discussed by Charles J. Drueck.

J. Clarence Keeler reviews the pathological condition and treatment of *chronic purulent otitis*, which is complicated with chronic mastoid disease.

VI. In the division on Pathology, E. B. Krumbhaar presents the essence of our present concept of the origin, distribution and function of the cells that go to make up the *reticulo-endothelial system*.

VII. In the last section of the text, Major-General Merritte W. Ireland presents to the reader the provisions for and the medical program of the *medical department reserve of the United States Army*.

And let us repeat. For the busy practitioner who finds it impossible to attend occasionally the clinics held in the various medical centers and who wishes to keep abreast of the times, no other avenue is open except to subscribe to one or two general medical journals and one or more special medical journals and to obtain a volume, such as the *International Clinics*, published quarterly, which presents clinics by the most prominent teachers and clinicians in this and in other countries.

PRACTICAL MEDICAL SERIES, 1924. Eight volumes. Under the general editorial charge of Charles L. Mix, A. M., M. D. Price of the entire series, \$15.00: *General Therapeutics*, Vol. VI, edited by Bernard Fantus, M. S., M. D., Associate Clinical Professor of Therapeutics, Rush Medical College. Pp. 380, with 19 figures and plates. Price \$2.00. *Dermatology and Urology*, Vol. VII, edited by William Allen Pusey,

A. M., M. D., Emeritus Professor Dermatology University of Illinois; Francis Eugene Senear, B. S., M. D., Professor and Head of Department of Dermatology and Syphilology, University of Illinois, and John H. Cunningham, M. D., Associate in Genito-Urinary Surgery, Harvard Medical College. Pp. 384, with 20 figures and 44 plates. Price \$2.00. *Nervous and Mental Diseases*, Vol. VIII, edited by Peter Bassoe, M. D., Clinical Professor of Neurology, Rush Medical College. Pp. 357, with 29 plates. Price \$2.00. Chicago: Year Book Publishers, 1924.

These three volumes, the last of the series of eight year books, continues to maintain the standard set by the preceding issues. In these texts a resume of the medical literature published in the preceding year of their publication is adequately reviewed. Could the personal observations and evaluation of the material reviewed be discussed by the authors these texts would be more valuable to the student of medicine. As they are now presented this series of texts presents compilations of the choicest material that has been developed and offers the practitioner a means whereby he may with the minimal amount of time and effort remain up-to-date on current medical literature.

LA PHYSIQUE DES RAYONS X. A L'USAGE DES MEDECINS. By Loisel, Instructor of Physics at the Faculte de Medecine, and Lomon, Radiologist to the Hospital and Head of the Department of Physics at the Faculte de Medecine. Paper. Price 10 francs, or about 65 cents. Pp. 150, with 49 illustrations. Paris: Masson & Co., 120, Boulevard Saint-Germain, 1925.

Using as a basis for this work the recent work of MM. Ledoux-Lebard and Dauvilier, together with that of Broglie, the authors have attempted in this elementary work to present the essential physical principles which they consider necessary for a scientific application of the roentgen ray. M. Loisel, known for his studies of the radioactivity of the mineral waters, presents the theoretical portion of this work, considering the physics and medical indications for the use of the x ray. He places into simple, understandable language the mod-

ern atomic theories necessary for the scientific coordination of the activities of the x ray. M. Lomon has had considerable experience with roentgen tubes.

Placing in rather elementary, clear and simple language a summary of the physics of the x ray and coordinating this necessary knowledge with the practical application of the radiographic elements, these writers have amalgamated in a brief text a mass of indispensable information for both specialist and general practitioner using the roentgen ray.